STIC Search Report
EIC 1700

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STIC Database Tracking Number: 200922

TO: Timothy Speer
Location: REM 5D75
Art Unit : 1775
September 8, 2006

Case Serial Number: 10/660578

From: Mei Huang
Location: EIC 1700
REMSEN 4B28
Phone: 571/272-3952
Mei.huang@uspto.gov

Search Notes

Examiner Speer,

Please feel free to contact me if you have any questions or if you would like to refine the search query,

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Mei Huang

sira
Search and Information Resources Administration

Banks, Kendra 200922

From: TIMOTHY SPEER [timothy.speer@uspto.gov]
Sent: Thursday, September 07, 2006 8:53 AM
To: STIC-EIC1700
Subject: Database Search Request, Serial Number: 10/660578

Requester:
TIMOTHY SPEER (P/1775)
Art Unit:
GROUP ART UNIT 1775
Employee Number:
70869
Office Location:
REM 05D75
Phone Number:
(571)272-8385
Mailbox Number:

Case serial number:
10/660578
Class / Subclass(es):
428/641, 450
Earliest Priority Filing Date:
02/20/03
Format preferred for results:
Paper
Search Topic Information:
I'm looking for the article defined in claims 8-14. It is a silicon substrate which has a patterned metal silicide layer, e.g, a silicide of Ni, Co, Ti, Pt, Fe or Pd, on the silicon substrate and a strain relaxed silicon germanium layer have dislocations on the silicide layer. Key terms include: silicon, metal silicide, patterned, thin line structure, silicon germanium, SiGe, strain relaxed, disclocations, nickel silicide, NiSi, NiSi2, dislocation density (for the SiGe layer). The article is made by depositing a strain relaxed SiGe layer on a Si substrate, forming a metal layer on the SiGe layer and heating the structure to diffuse the metal of the metal layer through dislocations in the SiGe layer, thereby forming the metal silicide layer at the Si/SiGe interface.
Special Instructions and Other Comments:

STIC Search Results Feedback Form

USPTO

EIC17000

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact***:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

  Types of relevant prior art found:
  - ☐ Foreign Patent(s)
  - ☐ Non-Patent Literature
    (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

```
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     (FILE 'HOME' ENTERED AT 15:54:33 ON 08 SEP 2006)

     FILE 'HCAPLUS' ENTERED AT 15:55:13 ON 08 SEP 2006
L1             1 SEA US2004166329/PN

     FILE 'REGISTRY' ENTERED AT 15:57:14 ON 08 SEP 2006
L2             2 SEA (12727-59-2/BI OR 7440-21-3/BI)
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L3              1 SEA 7440-21-3/RN
L4            770 SEA (SI(L)GE)/ELS (L) 2/ELC.SUB
L5              1 SEA L2 AND L4
L6           1978 SEA (SI(L)(NI OR CO OR TI OR PT OR FE OR PD))/ELS (L)
                  2/ELC.SUB

     FILE 'HCAPLUS' ENTERED AT 16:17:06 ON 08 SEP 2006
L7         499731 SEA L3 OR (SILICON OR SI)(2A)(SUBSTRAT? OR SURFACE? OR
                  BASE# OR SUBSTRUCT?)
L8          17736 SEA L4
L9           1219 SEA L5
L10         33495 SEA L6
L11          4602 SEA (SILICON(A)GERMANIUM OR SI(A)GE)(3A)(FILM? OR
                  THINFILM? OR LAYER?)
L12         13462 SEA L7 AND (L8 OR L11)    Si and SiGe
L13        150268 SEA METAL?(3A)(FILM? OR THINFILM? OR LAYER?)
L14           723 SEA L12 AND (L10 OR L13)
L15               QUE MULTILAYER? OR (MULTI? OR PLURAL? OR SEVERAL)(W)LAYER
                  ?
L16            36 SEA L14 AND L15
L17               QUE PATTERN?
L18            64 SEA L14 AND L17
L19             1 SEA L16 AND L18
L20               QUE DISLOCAT?
L21            21 SEA L14 AND L20
L22             1 SEA L18 AND L21
L23               QUE PENETRAT? OR SATURAT?
L24               QUE DIFFUS? OR SPREAD? OR DISTRIBUT?
L25            10 SEA L14 AND L23
L26           145 SEA L14 AND L24
L27             3 SEA L25 AND L26
L28             5 SEA L19 OR L22 OR L27
L29            34 SEA L16 NOT L28


=> d l28 ibib abs hitstr hitind 1-5
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L28 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	2005:728284 HCAPLUS
DOCUMENT NUMBER:	143:357432
TITLE:	Formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphological instability
AUTHOR(S):	Jang, Chi Hwan; Shin, Dong Ok; Baik, Sung Il; Kim, Young-Woon; Song, Young-Joo; Shim, Kyu-Hwan; Lee, Nae-Eung
CORPORATE SOURCE:	Department of Materials Engineering and Center for Advanced Plasma Surface Technology, Sungkyunkwan University, Kyunggi-do, 440-746, S. Korea
SOURCE:	Japanese Journal of Applied Physics, Part 1: Regular Papers, Brief Communications & Review Papers (2005), 44(7A), 4805-4813 CODEN: JAPNDE
PUBLISHER:	Japan Society of Applied Physics
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Nickel silicide was formed on strained-Si0.83Ge0.17/Si(001) using a

sacrificial Si capping (cap-Si) layer and its morphol. characteristics were investigated. Nickel silicide layers were grown by rapid thermal annealing of the samples with the structure of Ni (.simeq. 14 nm)/cap-Si (.simeq. 26 nm)/Si0.83Ge0.17/Si(001) at the annealing temp. (TA) range of 400-800°C. The phase formation, surface and interfacial morphologies, and elec. properties of the resulting samples were characterized by various measurement techniques, including X-ray diffraction, at. force microscopy, SEM, Auger electron spectroscopy, cross-sectional transmission electron microscopy, and the four-point probe method. The results showed the formation of a uniform layer nickel monosilicide (NiSi) with a thickness of .simeq.30 nm at 400-550°C and sheet resistance values of 6.5-7.9 Ω/.box.. The sheet resistance values of the samples annealed at TA ≥ 600°C were found to be increased, however, and this is attributed to the agglomeration of nickel monosilicide leading to discrete large-size NiSi grains. Microstructural and chem. analyses of the samples annealed at elevated temp., TA ≥ 750°C, indicated the formation of large agglomerated NiSi grains **penetrating** into the Si0.83Ge0.17/Si(001) structure and the conversion of the cap-Si layer situated in between the nickel silicide grains into an Si1-uGeu layer (u .simeq. 0.01-0.03), due to the out-**diffusion** of Ge from the SiGe layer during agglomeration. However, no NiSi2 phase was obsd. at these elevated annealing temps.

IT **12035-57-3**, Nickel silicide
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphol. instability)
RN 12035-57-3 HCAPLUS
CN Nickel silicide (NiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Ni≡Si

IT **7440-21-3**, Silicon, properties **113677-38-6**, Germanium 17, silicon 83 (atomic)
RL: PRP (Properties)
(formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphol. instability)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 113677-38-6 HCAPLUS
CN Silicon alloy, base, Si 65,Ge 35 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	65	7440-21-3
Ge	35	7440-56-4

CC 76-2 (Electric Phenomena)
IT **Diffusion**
(out-**diffusion**; formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphol. instability)
IT **12035-57-3**, Nickel silicide
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphol. instability)
IT **7440-21-3**, Silicon, properties **113677-38-6**, Germanium 17, silicon 83 (atomic)
RL: PRP (Properties)
(formation of nickel silicide layer on strained-Si0.83Ge0.17/Si(001) using a sacrificial Si layer and its morphol. instability)
REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L28 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:701646 HCAPLUS
DOCUMENT NUMBER: 141:216852
TITLE: Method for fabricating a thin line structure, multilayered structure, and multilayered intermediate structure
INVENTOR(S): Sakai, Akira; Zaima, Shigeaki; Yasuda, Yukio; Nakatsuka, Osamu
PATENT ASSIGNEE(S): Nagoya University, Japan
SOURCE: U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2004166329	A1	20040826	US 2003-660578		20030912
JP 2004253607	A2	20040909	JP 2003-42275		20030220
PRIORITY APPLN. INFO.:			JP 2003-42275	A	20030220

AB On a given **silicon substrate** is epitaxially grown a strain-relaxed **silicon germanium layer** with **penetrated** dislocations and formed a **metallic layer** to form a multilayered intermediate structure, which is heated. In this case, metallic elements of the **metallic layer** are **diffused** through the **penetrated** dislocations of the **silicon germanium layer** to form a thin line structure made of metallic silicide at a boundary face between the **silicon base** and the **silicon germanium**

```
     layer.
IT   7440-21-3, Silicon, uses 12727-59-2
     RL: DEV (Device component use); USES (Uses)
        (method for fabrication of a thin line and multilayered
        intermediate structure)
RN   7440-21-3  HCAPLUS
CN   Silicon (7CI, 8CI, 9CI)  (CA INDEX NAME)


Si


RN   12727-59-2  HCAPLUS
CN   Germanium alloy, base, Ge 0-100,Si 0-100 (9CI)  (CA INDEX NAME)

Component   Component      Component
             Percent    Registry Number
=========+=============+==============
    Ge        0  - 100       7440-56-4
    Si        0  - 100       7440-21-3

IC   ICM  B32B015-00
INCL 428432000; 428433000
CC   76-3 (Electric Phenomena)
IT   7440-21-3, Silicon, uses 12727-59-2
     RL: DEV (Device component use); USES (Uses)
        (method for fabrication of a thin line and multilayered
        intermediate structure)

L28  ANSWER 3 OF 5  HCAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2004:21042  HCAPLUS
DOCUMENT NUMBER:          140:69109
TITLE:                    Semiconductor device and its manufacturing
                          method
INVENTOR(S):              Watanabe, Heiji; Endo, Kazuhiko; Manabe, Kenzo
PATENT ASSIGNEE(S):       NEC Corporation, Japan
SOURCE:                   PCT Int. Appl., 41 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------
     --------
     WO 2004004014        A1    20040108   WO 2003-JP7761
                                                                  200306
                                                                  19
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
             CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,
             GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC,
             LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI,
             NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ,
             TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
             BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
             EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
             SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
             NE, SN, TD, TG
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JP 2004031760	A2	20040129	JP 2002-187596		20020627
AU 2003244275	A1	20040119	AU 2003-244275		20030619
CN 1663051	A	20050831	CN 2003-815014		20030619
US 2005247985	A1	20051110	US 2004-519084		20041223
PRIORITY APPLN. INFO.:			JP 2002-187596	A	20020627
			WO 2003-JP7761	W	20030619

AB A semiconductor device having a gate insulating film and a gate electrode formed in this order on a **Si substrate** is described, where the gate insulating film includes a N-contg. high dielec. const. insulating film with a structure in which N is introduced into a metal oxide or a metal silicate, the N concn. in the N-contg. high dielec. const. insulating film has a **distribution** in the direction of the film thickness, and the position where the N concn. is max. in the direction of the film thickness is present in a region away from the **Si substrate.** A method for manufg. a semiconductor device comprising a step of introducing N into a high dielec. const. insulating **film** of a **metal** oxide or a metal silicate by exposure to a N-contg. plasma is also disclosed. As a result, the thermal stability of the high dielec. const. gate insulating film is improved, and the dopant **penetration** is suppressed, thereby preventing the elec. characteristics of the interface with the **Si substrate** from degrading.

IT **7440-21-3**, Silicon, uses **11148-21-3**
RL: DEV (Device component use); USES (Uses)
(N-contg. gate insulator of semiconductor device and its manufg. method)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM H01L029-78
ICS H01L021-336
CC 76-3 (Electric Phenomena)

IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses
7440-21-3, Silicon, uses 7631-86-9, Silica, uses
11148-21-3 12033-89-5, Silicon nitride, uses 37248-04-7, Hafnium silicate
RL: DEV (Device component use); USES (Uses)
(N-contg. gate insulator of semiconductor device and its manufg. method)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

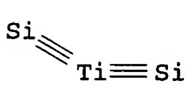
L28 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:727501 HCAPLUS
DOCUMENT NUMBER: 130:9399
TITLE: A 42-GHz (fmax) SiGe-base HBT using reduced pressure CVD
AUTHOR(S): Cho, D.-H.; Ryum, B. R.; Han, T.-H.; Lee, S.-M.; Shin, S.-C.; Lee, C.
CORPORATE SOURCE: Semiconductor Technology Division, Electronics and Telecommunications Research Institute, Taejon, 305-600, S. Korea
SOURCE: Solid-State Electronics (1998), 42(9), 1641-1649
CODEN: SSELA5; ISSN: 0038-1101
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A SiGe HBT having a fmax higher than fT was fabricated using a prodn. CVD reactor which allows SiH2Cl2-**based Si** collector epi-growth at high rate as well as SiH4-based SiGe base epi-growth at low rate. Transistor design together with process integration was focused on lowering the extrinsic base resistance and the collector-base capacitance. To this purpose, a TiSi2 layer with a sheet resistance of 1.3 Ω/sq was used as a base electrode and a selectively implanted collector was used. For the base layer, an undoped-Si (300 Å)/p-SiGe (200 Å, NA = 4.4 + 1018 cm-3, linearly-graded Ge compn. from 0 to 0.19)/undoped-Si0.81Ge0.19 (110 Å)/undoped-Si (300 Å) **multilayer** was deposited on a LOCOS-**patterned** wafer. To form the emitter-base junction and to activate the As dopants in the polysilicon-emitter, rapid thermal annealing (RTA) at 900° for 20 s was performed only one time so that outdiffusion of the B in the base could be suppressed. The collector and base currents are nearly ideal. The authors obtained a fT of 37 GHz which is near the theor. limit imposed by BVCEO and a fmax of 42 GHz. The base resistance and the collector-base capacitance extd. from measured S-parameters have a value of 37 Ω and 27.2 fF, resp.

IT **12039-83-7**, Titanium silicide (TiSi2)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(base electrode; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **118392-03-3**, Titanium silicide (TiSi2.6)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(electrodes; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
RN 118392-03-3 HCAPLUS
CN Titanium silicide (TiSi2.6) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Si	2.6	7440-21-3

IT **7440-21-3P**, Silicon, processes **37380-03-3P**, Germanium 20, silicon 80 (atomic) **83590-41-4P**, Germanium 0-19, silicon 81-100 (atomic) **115675-33-7P**, Germanium 19, silicon 81 (atomic)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 37380-03-3 HCAPLUS
CN Silicon alloy, base, Si 61,Ge 39 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	61	7440-21-3
Ge	39	7440-56-4

RN 83590-41-4 HCAPLUS
CN Silicon alloy, base, Si 62-100,Ge 0-38 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	62 - 100	7440-21-3
Ge	0 - 38	7440-56-4

RN 115675-33-7 HCAPLUS
CN Silicon alloy, base, Si 62,Ge 38 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	62	7440-21-3
Ge	38	7440-56-4

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75
ST fabrication **silicon** germanium **base** HBT; reduced

pressure CVD germanium silicon
IT Electric resistance
(base; from fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT Vapor deposition process
(chem.; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT Electric capacitance
(collector-base; from fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT Heterojunction bipolar transistors
Rapid thermal annealing
Semiconductor device fabrication
(fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT Diffusion
(out-diffusion; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT **12039-83-7**, Titanium silicide (TiSi2)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(base electrode; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT **118392-03-3**, Titanium silicide (TiSi2.6)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(electrodes; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT **7440-21-3P**, Silicon, processes **37380-03-3P**, Germanium 20, silicon 80 (atomic) **83590-41-4P**, Germanium 0-19, silicon 81-100 (atomic) **115675-33-7P**, Germanium 19, silicon 81 (atomic)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT 7440-38-2, Arsenic, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT 7440-42-8, Boron, processes
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)
IT 4109-96-0, Dichlorosilane 7803-62-5, Silicon hydride (SiH4), uses
RL: NUU (Other use, unclassified); USES (Uses)
(precursor; fabrication of **silicon**-germanium **base** HBT using reduced-pressure CVD)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L28 ANSWER 5 OF 5 HCAPLUS
ACCESSION NUMBER: 1992:582595 HCAPLUS
DOCUMENT NUMBER: 117:182595
TITLE: In situ transmission electron microscopy measurements of the electrical and structural properties of strained layer germanium

silicide/silicon p-n junctions

AUTHOR(S): Ross, F. M.; Hull, R.; Bahnck, D.; Bean, J. C.; Peticolas, L. J.; Hamm, R. A.; Huggins, H. A.
CORPORATE SOURCE: Bell Lab., AT and T, Murray Hill, NJ, 07974, USA
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1992), 10(4), 2008-12
CODEN: JVTBD9; ISSN: 0734-211X
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The correlation between the **dislocation** structure and the elec. properties of strained layer p-n junction diodes was studied by examg. both structural and elec. characteristics simultaneously in a transmission electron microscope. Device characteristics and structural changes are followed on a single specimen as it is subjected in situ to heat treatment designed to induce relaxation. The nucleation and growth of **dislocations** at the strained interfaces are described for different diode geometries and the influence of these **dislocations** on the elec. properties of the diodes. The results indicate the dominant role of nucleation sites in the relaxation process. An enhancement in layer stability after **patterning** and **metalizing** strained **layer** heterostructures was obsd.

IT **7440-21-3**, Silicon, uses
RL: PRP (Properties)
(semiconductor p-n junction contg. germanium silicide and, elec. and structural properties of)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **37232-85-2 37380-03-3**
RL: PRP (Properties)
(semiconductor p-n junction contg. silicon and, elec. and structural properties of)

RN 37232-85-2 HCAPLUS

CN Silicon alloy, base, Si 69,Ge 31 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	69	7440-21-3
Ge	31	7440-56-4

RN 37380-03-3 HCAPLUS

CN Silicon alloy, base, Si 61,Ge 39 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	61	7440-21-3
Ge	39	7440-56-4

CC 76-3 (Electric Phenomena)

IT **7440-21-3**, Silicon, uses
RL: PRP (Properties)
(semiconductor p-n junction contg. germanium silicide and, elec.

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        and structural properties of)
IT    37232-85-2 37380-03-3
      RL: PRP (Properties)
         (semiconductor p-n junction contg. silicon and, elec. and
         structural properties of)


=> d l29 ibib abs hitstr hitind 1-34

L29  ANSWER 1 OF 34  HCAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2006:37001  HCAPLUS
DOCUMENT NUMBER:          144:119530
TITLE:                    Silicon nitride film with stress control is
                          semiconductor device
INVENTOR(S):              Iyer, R. Suryanarayanan; Lam, Andrew M.; Maeda,
                          Yuji; Mele, Thomas; Nouri, Faran; Smith, Jacob
                          W.; Seutter, Sean M.; Tandon, Sanjeev; Singh
                          Thakur, Randhir P.; Thirupapuliyur, Sunderraj
PATENT ASSIGNEE(S):       USA
SOURCE:                   U.S. Pat. Appl. Publ., 26 pp.
                          CODEN: USXXCO
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND    DATE        APPLICATION NO.          DATE
     ---------------     ----    --------    --------------------
     --------
     US 2006009041        A1     20060112    US 2004-885969
                                                                      200407
                                                                      06
     WO 2006014471        A1     20060209    WO 2005-US23933
                                                                      200507
                                                                      05
         W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
            CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
            GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,
            KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
            MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
            SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA,
            UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
        RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
            IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
            BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
            TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
            ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
PRIORITY APPLN. INFO.:                       US 2004-885969      A
                                                                      200407
                                                                      06
```

AB The embodiments of the invention pertain to methods for forming a nitride etch stop film and a **multilayer** nitride etch stop stack to mech. create a controlled stress (tensile or compressive) in a semiconductor device. An assembly comprises a **multilayer** nitride stack having nitride etch stop layers formed on top of one another, each of the nitride etch stop layers is formed using a film forming process. A method of making the **multilayer** nitride stack includes placing a substrate in a single wafer deposition chamber and thermally shocking the substrate

momentarily prior to deposition. A first nitride etch stop layer is deposited over the substrate. A second nitride etch stop layer is deposited over the first nitride etch stop layer.
IT **7440-21-3**, Silicon, uses **12790-21-5**
RL: DEV (Device component use); USES (Uses)
(silicon nitride film with stress control)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12790-21-5 HCAPLUS
CN Silicon alloy, base, Si,Ge (9CI) (CA INDEX NAME)

Component	Component Registry Number
Si	7440-21-3
Ge	7440-56-4

IT **11104-62-4**, Cobalt silicide **39467-10-2**, Nickel silicide
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(silicon nitride film with stress control)
RN 11104-62-4 HCAPLUS
CN Cobalt silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	x	7440-48-4
Si	x	7440-21-3

RN 39467-10-2 HCAPLUS
CN Nickel silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	x	7440-21-3
Ni	x	7440-02-0

INCL 438724000
CC 76-3 (Electric Phenomena)
IT **7440-21-3**, Silicon, uses 7631-86-9, Silicon oxide, uses **12790-21-5**
RL: DEV (Device component use); USES (Uses)
(silicon nitride film with stress control)
IT **11104-62-4**, Cobalt silicide **39467-10-2**, Nickel silicide
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(silicon nitride film with stress control)

L29 ANSWER 2 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1314023 HCAPLUS
DOCUMENT NUMBER: 144:62731
TITLE: Fabrication of single-metal gate material CMOS using strained Si-**silicon**

germanium heterojunction **layered** substrate

INVENTOR(S): Antoniadis, Dimitri A.; Hoyt, Judy L.; Jung, Jongwan; Yu, Shaofeng
PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA
SOURCE: PCT Int. Appl., 24 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005119762	A1	20051215	WO 2005-US18514	20050526

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005274978	A1	20051215	US 2005-138951	20050526
PRIORITY APPLN. INFO.:			US 2004-575039P P	20040527

AB A strained Si/strained SiGe dual-channel layer substrate provides mobility advantage and when used as CMOS substrate enables single work-function metal-gate electrode technol. A single metal electrode with work-function of 4.5 eV produces near ideal CMOS performance on a dual-channel layer substrate that consists sequentially of a silicon wafer, an epitaxially grown $Si_{0.7}Ge_{0.3}$ relaxed layer, a compressively strained $Si_{0.4}Ge_{0.6}$ layer, and a tensile-strained Si cap layer.

IT **7440-21-3**, Silicon, uses **11148-22-4** **12623-04-0** **12675-06-8**
RL: DEV (Device component use); USES (Uses)
(**layer**; fabrication of single-**metal** gate material CMOS using strained Si-**silicon** **germanium** heterojunction **layered** substrate)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-22-4 HCAPLUS
CN Germanium alloy, base, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12623-04-0 HCAPLUS
CN Germanium alloy, base, Ge 53,Si 47 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	53	7440-56-4
Si	47	7440-21-3

RN 12675-06-8 HCAPLUS
CN Germanium alloy, base, Ge 79,Si 21 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	79	7440-56-4
Si	21	7440-21-3

IC ICM H01L021-8238
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 56
ST gate electrode CMOS transistor silicon germanium heterojunction **multilayer**
IT MOS devices
(complementary; fabrication of single-metal gate material CMOS using strained Si-**silicon germanium** heterojunction **layered** substrate)
IT Gate contacts
(electrode; fabrication of single-metal gate material CMOS using strained Si-**silicon germanium** heterojunction **layered** substrate)
IT MOSFET (transistors)
Semiconductor device fabrication
Semiconductor heterojunctions
(fabrication of single-metal gate material CMOS using strained Si-**silicon germanium** heterojunction **layered** substrate)
IT **7440-21-3**, Silicon, uses **11148-22-4**
12623-04-0 12675-06-8
RL: DEV (Device component use); USES (Uses)
(**layer**; fabrication of single-**metal** gate material CMOS using strained Si-**silicon germanium** heterojunction **layered** substrate)
IT 25583-20-4, Titanium nitride (TiN)
RL: DEV (Device component use); USES (Uses)
(single metal gate electrode; fabrication of single-metal gate material CMOS using strained Si-**silicon germanium** heterojunction **layered** substrate)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 3 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:301655 HCAPLUS
DOCUMENT NUMBER: 142:383683
TITLE: Fabrication of a **multilayer** structure with an exposed **metal layer**
INVENTOR(S): Ruttkowski, Eike; Ilicali, Guerkan; Luyken, R. Johannes; Hofmann, Franz; Alba, Manuela
PATENT ASSIGNEE(S): Infineon Technologies A.-G., Germany
SOURCE: Ger. Offen., 16 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10337830	A1	20050407	DE 2003-10337830	20030818
DE 10337830	B4	20050825		
US 2005239272	A1	20051027	US 2004-920043	20040816

PRIORITY APPLN. INFO.: DE 2003-10337830 A 20030818

AB The fabrication of a **multilayer** structure, with **metal layer** on the surface of a 1st wafer and with a buffer **layer** on the **metal layer**, is described. A 2nd wafer is created on the buffer layer and the 1st wafer is then removed so that the **metal layer** is exposed.

IT **7440-21-3**, Silicon, uses **11148-22-4**
RL: DEV (Device component use); USES (Uses)
(fabrication of **multilayer** structure with exposed **metal layer**)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-22-4 HCAPLUS
CN Germanium alloy, base, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM H01L021-283
ICS H01L051-10; B81C001-00; G01N013-10
CC 76-2 (Electric Phenomena)
ST **multilayer** structure **metal layer** miniature switch
IT Electric switches

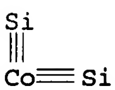
(fabrication of **multilayer** structure with exposed **metal layer**)
IT Epoxy resins, uses
RL: DEV (Device component use); USES (Uses)
(fabrication of **multilayer** structure with exposed **metal layer**)
IT Electric contacts
(**multilayer**; fabrication of **multilayer** structure with exposed **metal layer**)
IT 1303-00-0, Gallium arsenide (GaAs), uses 1312-41-0 1314-98-3, Zinc sulfide (ZnS), uses 1344-28-1, Aluminum oxide, uses 7440-05-3, Palladium, uses **7440-21-3**, Silicon, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-58-6, Hafnium, uses 7631-86-9, Silicon oxide, uses **11148-22-4** 12055-23-1, Hafnium oxide 12063-98-8, Gallium phosphide (GaP), uses 37382-15-3, Aluminum gallium arsenide 106070-25-1, Gallium indium arsenide 106311-99-3, Aluminum gallium phosphide
RL: DEV (Device component use); USES (Uses)
(fabrication of **multilayer** structure with exposed **metal layer**)
IT 12033-89-5, Silicon nitride, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fabrication of **multilayer** structure with exposed **metal layer**)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 4 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:789131 HCAPLUS
DOCUMENT NUMBER: 142:229202
TITLE: Strain relaxation of epitaxial CoSi2 and SiGe layers in cap-Si/Si0.83Ge0.17/Si(001) and epi-CoSi2/Si0.83Ge0.17/Si(001) structures
AUTHOR(S): Shin, D. O.; Sardela, M. R., Jr.; Ban, S. H.; Lee, N.-E.; Shim, K.-H.
CORPORATE SOURCE: Department of Materials Engineering, Center for Advanced Plasma Surface Technology, SungKyunKwan University, Kyunggi-do, 440-746, S. Korea
SOURCE: Applied Surface Science (2004), 237(1-4), 139-145
CODEN: ASUSEE; ISSN: 0169-4332
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Strain relaxation behaviors of the epitaxial CoSi2 (epi-CoSi2) and Si0.83Ge0.17 layers in epi-CoSi2/Si0.83Ge0.17/Si(0 0 1) and cap-Si/Si0.83Ge0.17/Si(0 0 1) structures were investigated by high-resoln. X-ray diffraction (HR-XRD) analyses. Samples were treated at the temp., TA = 650-900° by rapid thermal annealing. Comparative measurements showed a different strain relaxation behavior in the SiGe layers with and without CoSi2 layer. Ge content and lattice mismatch in the SiGe film of the epi-CoSi2/Si0.83Ge0.17/Si(0 0 1) are smaller than those in the SiGe layer in cap-Si/SiGe/Si(0 0 1) possibly due to the diffusion of Ge into the tensile-stressed epi-CoSi2 layer to reduce the compressive stress in the SiGe layer at elevated temp. The analyses of high-resoln. ω-2θ scan spectra and reciprocal space mapping showed that epi-CoSi2 layer is under tensile residual stress and a significant strain relaxation starts at TA = 900°

indicating of thermal stability up to TA = 850°.
IT **7440-21-3**, Silicon, properties **12017-12-8**, Cobalt disilicide **113677-38-6**, Germanium 17, silicon 83 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(strain relaxation of epitaxial CoSi2 and SiGe layers in cap-Si/Si0.83Ge0.17/Si(001) and epi-CoSi2/Si0.83Ge0.17/Si(001) structures)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 113677-38-6 HCAPLUS
CN Silicon alloy, base, Si 65,Ge 35 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	65	7440-21-3
Ge	35	7440-56-4

CC 75-1 (Crystallography and Liquid Crystals)
ST cobalt silicide germanium silicon epitaxial **multilayer** strain relaxation
IT Epitaxial films
Mechanical relaxation
Multilayers
Rapid thermal annealing
(strain relaxation of epitaxial CoSi2 and SiGe layers in cap-Si/Si0.83Ge0.17/Si(001) and epi-CoSi2/Si0.83Ge0.17/Si(001) structures)
IT **7440-21-3**, Silicon, properties **12017-12-8**, Cobalt disilicide **113677-38-6**, Germanium 17, silicon 83 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(strain relaxation of epitaxial CoSi2 and SiGe layers in cap-Si/Si0.83Ge0.17/Si(001) and epi-CoSi2/Si0.83Ge0.17/Si(001) structures)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 5 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:545809 HCAPLUS
DOCUMENT NUMBER: 141:80575
TITLE: Method for manufacture of strained semiconductor single crystals as channel layers for semiconductor **multilayer** structures as

metal oxide semiconductors for integrated circuits

INVENTOR(S):	Usami, Tokutaka; Ujihara, Toru; Fujiwara, Kozo; Nakajima, Kazuo
PATENT ASSIGNEE(S):	Tohoku University, Japan
SOURCE:	Jpn. Kokai Tokkyo Koho, 9 pp. CODEN: JKXXAF
DOCUMENT TYPE:	Patent
LANGUAGE:	Japanese
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004189505	A2	20040708	JP 2002-355674	20021206
PRIORITY APPLN. INFO.:			JP 2002-355674	20021206

AB The method includes prepg. unstrained semiconductor single crystals A having lattice const. A', forming amorphous semiconductors B having lattice const. B' other than A', heating A and B for epitaxial growth of B, and solid-phase interdiffusion of A and B to give unstrained semiconductor mixed crystal C having lattice const. C', and formation of strained semiconductor single crystals D having lattice const. D' different from C' by epitaxial growth. Semiconductor **multilayer** structures include sequential layers of semiconductor single crystal substrates, insulators, unstrained semiconductor mixed crystals, and the strained semiconductor crystals. Strained semiconductor single crystals are manufd. more easily and economically than conventional methods using ion implantation app., thermal oxidn. app., etc.

IT **7440-21-3**, Silicon, processes
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **11148-21-3P**
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)

RN 11148-21-3 HCAPLUS

CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component Component

Registry Number	
Ge	7440-56-4
Si	7440-21-3

IC ICM C30B001-10
ICS C30B001-04; C30B029-52; H01L021-20; H01L021-203; H01L027-12
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 75
ST strained semiconductor single crystal MOS device; amorphous semiconductor unstrained single crystal interdiffusion; **multilayer** integrated circuit MOS strained semiconductor
IT Semiconductor materials
(layered; manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)
IT MOS devices
(manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)
IT Integrated circuits
(**multilayer**; manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)
IT 7440-56-4, Germanium, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(amorphous; manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)
IT **7440-21-3**, Silicon, processes
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)
IT **11148-21-3P**
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manuf. of strained semiconductor single crystals as channel **layers** for **multilayer metal** oxide semiconductors for integrated circuits)

L29 ANSWER 6 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:470757 HCAPLUS
DOCUMENT NUMBER: 141:32282
TITLE: Formation of **multilayer** gate structure
INVENTOR(S): Chen, Neng-Kuo; Akasaka, Yasushi
PATENT ASSIGNEE(S): Hua-Pang Electronic Corp., Taiwan; Toshiba Corp.
SOURCE: Jpn. Kokai Tokkyo Koho, 22 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 2004165174 A2 20040610 JP 2002-234990
200208
12
PRIORITY APPLN. INFO.: JP 2002-234990
200208
12

AB A method for forming a **multilayer** gate structure involves forming a Si layer doped with p-type ions, forming a shielding layer contg. a shielding component on the Si **layer**, and forming a **metal layer** on the shielding component via a bonding layer for decreasing the contact resistance of the gate structure while preventing the p-type ions from diffusing into the bonding layer with the shielding layer. Specifically, the p-type ions may comprise Br ions, the bonding layer may comprise W nitride, the **metal layer** may comprise W, and the shielding **layer** may contain Ge, **Ge-Si**, Mo, or Ta.
IT **7440-21-3**, Silicon, uses **11148-21-3**
RL: DEV (Device component use); USES (Uses)
(formation of **multilayer** gate structure having diffusion barrier)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM H01L029-78
ICS H01L029-423; H01L029-49
CC 76-3 (Electric Phenomena)
ST **multilayer** gate structure diffusion barrier
IT Diffusion barrier
MOS devices
Semiconductor device fabrication
(formation of **multilayer** gate structure having diffusion barrier)
IT 7439-98-7, Molybdenum, uses **7440-21-3**, Silicon, uses 7440-25-7, Tantalum, uses 7440-33-7, Tungsten, uses 7440-56-4, Germanium, uses **11148-21-3** 37359-53-8, Tungsten nitride
RL: DEV (Device component use); USES (Uses)
(formation of **multilayer** gate structure having diffusion barrier)
IT 24959-67-9, Bromide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(formation of **multilayer** gate structure having diffusion barrier)

L29 ANSWER 7 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

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ACCESSION NUMBER:        2004:447296  HCAPLUS
DOCUMENT NUMBER:         140:432656
TITLE:                   Manufacture of semiconductor devices
INVENTOR(S):             Matsumura, Hiroaki
PATENT ASSIGNEE(S):      Sony Corp., Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 6 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------
     --------
     JP 2004158483        A2    20040603    JP 2002-319897
                                                                   200211
                                                                   01
PRIORITY APPLN. INFO.:                      JP 2002-319897
                                                                   200211
                                                                   01
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AB Semiconductor devices contain: substrates with buried diffusion layers; oxide films with openings on the substrates; epitaxial layers covering the oxides films and filling the openings; and silicide layers on the epitaxial layers. The silicide layers consist of 1st layers which are formed when metals absorbed Si during heat treatment, and 2nd layers which are formed on the 1st **layers** when the **metals** are diffused in Si during heat treatment.

IT **11148-21-3P**
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(epitaxial **layers**; formation of **metal** silicide **layers** on epitaxial layers in manuf. of semiconductor devices)

RN 11148-21-3 HCAPLUS

CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IT **11104-62-4P**, Cobalt silicide **12738-91-9P**, Titanium silicide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)

RN 11104-62-4 HCAPLUS

CN Cobalt silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	x	7440-48-4
Si	x	7440-21-3

RN 12738-91-9 HCAPLUS
CN Titanium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	x	7440-32-6
Si	x	7440-21-3

IT **7440-21-3**, Silicon, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM H01L021-331
ICS H01L021-28; H01L029-732
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75
ST semiconductor device metal silicide **multilayer**; metal silicon absorption diffusion epitaxy
IT Heat treatment
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)
IT Silicides
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)
IT Bipolar transistors
Epitaxy
(formation of **metal** silicide **layers** on epitaxial layers in manuf. of semiconductor devices)
IT **11148-21-3P**
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(epitaxial **layers**; formation of **metal** silicide **layers** on epitaxial layers in manuf. of semiconductor devices)
IT **11104-62-4P**, Cobalt silicide **12738-91-9P**, Titanium silicide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)
IT **7440-21-3**, Silicon, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(formation of **metal** silicide **layers** in manuf. of semiconductor devices)

L29 ANSWER 8 OF 34 HCAPLUS
ACCESSION NUMBER: 2004:414239 HCAPLUS
DOCUMENT NUMBER: 141:131987
TITLE: Strain modulation of β-$FeSi_2$ by Ge-segregation in solid-phase growth of

[a-Si/a-FeSiGe]n **multi-layer**

AUTHOR(S): Murakami, Y.; Kenjo, A.; Sadoh, T.; Yoshitake, T.; Itakura, M.; Miyao, M.
CORPORATE SOURCE: Department of Electronics, Kyushu University, Fukuoka, 812-8581, Japan
SOURCE: Materials Research Society Symposium Proceedings (2004), 796(Critical Interfacial Issues in Thin-Film Optoelectronic and Energy Conversion Devices), 57-62
CODEN: MRSPDH; ISSN: 0272-9172
PUBLISHER: Materials Research Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Strain modulation of β-FeSi2 by Ge doping was studied. By solid-phase growth of [a-Si/a-Fe0.4Si0.5Ge0.1]n layered structures, the [a-SiGe/β-FeSi2-xGex]n **multi-layered** structures (n = 1, 2, 4) were formed after annealing at 700°. From the anal. of the x-ray diffraction spectra, β-FeSi1.3Ge0.7 strained by 0.4-0.5% was formed for the sample with n = 1. This value corresponded to the band gap modulation of 30 meV based on the theor. calcn. The strains decreased with increasing n, which was due to that segregation of Ge atoms from the a-Fe0.4Si0.5Ge0.1 layers to the a-Si layers became significant with increasing n. After annealing at 800°, agglomeration of β-FeSi2 occurred, and nanocrystals of relaxed β-FeSi2 and c-Si0.7Ge0.3 were formed. These new structures are useful for formation of opto-elec. devices.

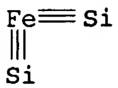
IT **7440-21-3**, Silicon, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
([a-SiGe/β-FeSi2-xGex]n **multi-layer** formed by annealing of [a-Si/a-FeSiGe]n **multi-layer**)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **12623-04-0**, Germanium 30 silicon 70 (atomic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(nanocrystals of relaxed β-FeSi2 and c-Si0.7Ge0.3 formed by annealing of [a-Si/a-FeSiGe]n **multi-layer**)
RN 12623-04-0 HCAPLUS
CN Germanium alloy, base, Ge 53,Si 47 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	53	7440-56-4
Si	47	7440-21-3

IT **12022-99-0**, Iron silicide (FeSi2)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(strain modulation of β-FeSi2 by Ge doping)
RN 12022-99-0 HCAPLUS
CN Iron silicide (FeSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75
IT Band gap
(band gap modulation of β-FeSi2 by Ge-segregation in solid-phase growth of [a-Si/a-FeSiGe]n **multi-layer**)
IT Crystallization
Optoelectronic semiconductor devices
Strain
(strain modulation of β-FeSi2 by Ge-segregation in solid-phase growth of [a-Si/a-FeSiGe]n **multi-layer**)
IT **7440-21-3**, Silicon, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
([a-SiGe/β-FeSi2-xGex]n **multi-layer** formed by annealing of [a-Si/a-FeSiGe]n **multi-layer**)
IT 721959-79-1, Germanium 7, iron 10, silicon 13 (atomic)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
([a-SiGe/β-FeSi2-xGex]n **multi-layer** formed by annealing of [a-Si/a-FeSiGe]n **multi-layer**)
IT **12623-04-0**, Germanium 30 silicon 70 (atomic)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(nanocrystals of relaxed β-FeSi2 and c-Si0.7Ge0.3 formed by annealing of [a-Si/a-FeSiGe]n **multi-layer**)
IT **12022-99-0**, Iron silicide (FeSi2)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(strain modulation of β-FeSi2 by Ge doping)
IT 642079-77-4, Germanium 10 iron 40 silicon 50 (atomic)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(strain modulation of β-FeSi2 by Ge-segregation in solid-phase growth of [a-Si/a-FeSiGe]n **multi-layer**)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 9 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:970570 HCAPLUS
DOCUMENT NUMBER: 140:279143
TITLE: Self-aligned Ti germanosilicide formation on a polycrystalline Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors
AUTHOR(S): Lee, Seung-yun; Park, Chan Woo; Kang, Jin-yoeng
CORPORATE SOURCE: Basic Research Laboratory, Electronics and Telecommunications Research Institute (ETRI), Daejeon, 305-350, S. Korea
SOURCE: Journal of Electronic Materials (2003), 32(11),

1349-1356
CODEN: JECMA5; ISSN: 0361-5235
PUBLISHER: Minerals, Metals & Materials Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB This work reports our investigation of a microstructure of self-aligned Ti germanosilicide made on polycryst. Si/SiGe/Si **multilayers.** The existence of the SiGe layer restricted the growth of the Ti germanosilicide layer and produced protrusions penetrating the underlying polycryst. layer. Each protrusion corresponded to a stacking-faulted single grain of the C49 phase. The microstructure of the thin Ti germanosilicide layer and the deep protrusions caused an increase of the sheet resistance and the contact resistivity of the extrinsic base region. The raised contact resistivity led to a degrdn. of radiofrequency (RF) and noise characteristics of the SiGe heterojunction bipolar transistor (HBT).

IT **7440-21-3**, Silicon, processes **11148-21-3**
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

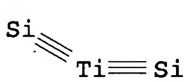
Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IT **12039-83-7**, Titanium disilicide
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75

IT Contact resistance
Electric noise
Heterojunction bipolar transistors
Microstructure
Sheet resistance

Siliconizing
Stacking faults
(self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

IT 12355-90-7, Difluoroboron 1+
RL: MOA (Modifier or additive use); USES (Uses)
(ion implantation; self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

IT **7440-21-3**, Silicon, processes 7440-32-6, Titanium, processes 7631-86-9, Silica, processes **11148-21-3** 25583-20-4, Titanium nitride TiN
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

IT **12039-83-7**, Titanium disilicide 125135-18-4, Germanium titanium silicide ((Ge,Si)2Ti)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(self-aligned Ti germanosilicide formation on a polycryst. Si/SiGe/**Si** extrinsic **base** for SiGe heterojunction bipolar transistors)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 2003:553877 HCAPLUS
DOCUMENT NUMBER: 140:208109
TITLE: Epitaxial growth of CoSi2 on **Si**(100) **substrate** by Co/GeSi/Ti/Si **multilayer** solid phase reaction
AUTHOR(S): Xu, Beilei; Qu, Xinping; Han, Yongzhao; Ru, Guoping; Li, Bingzong; Cheung, W. Y.; Wong, S. P.; Chu, Paul K.
CORPORATE SOURCE: Department of Microelectronics, ASIC and System State Key Laboratory, Fudan University, Shanghai, 200433, Peop. Rep. China
SOURCE: Guti Dianzixue Yanjiu Yu Jinzhan (2003), 23(2), 149-154
CODEN: GDYJE2; ISSN: 1000-3819
PUBLISHER: Guti Dianzixue Yanjiu Yu Jinzhan Bianjibu
DOCUMENT TYPE: Journal
LANGUAGE: Chinese

AB The effect of amorphous **Ge Si layer** interposed between Co and Ti layers on **Si** (100) **substrate** on the solid phase heteroepitaxy of CoSi2/Si structure was studied. Co/Ge-Si/Ti **multilayers** were sputtered on **Si substrates.** Epitaxial CoSi2 film with good elec. properties was formed after rapid thermal annealing. When the thickness of the interposed **Ge-Si films** changed from 0 to 10 nm, the formed CoSi2 film always has the favorable epitaxial quality and stable low elec. resistivity. At low annealing temp. (< 800°), Ti will combine with Co, O or Si to form ternary compds. such as Co2Ti4O and Ti2Co3Si, which will act as diffusion barrier and promote the epitaxial growth of CoSi2 film. The Ge-Si interlayer will reduce

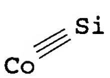
    the consumption of **substrate Si** during CoSi2
    formation and the small amts. of Ge will improve the mismatch
    between epitaxial CoSi2 and **substrate Si.**
IT **7440-21-3**, Silicon, processes **37232-85-2**,
    Germanium 15, silicon 85 (atomic)
    RL: CPS (Chemical process); PEP (Physical, engineering or chemical
    process); PYP (Physical process); TEM (Technical or engineered
    material use); PROC (Process); USES (Uses)
       (epitaxy of cobalt silicide on **silicon**
       substrate by cobalt/germanium-silicon/titanium/silicon
       multilayer solid phase reaction)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 37232-85-2 HCAPLUS
CN Silicon alloy, base, Si 69,Ge 31 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	69	7440-21-3
Ge	31	7440-56-4

IT **12017-11-7**, Cobalt silicide (CoSi)
    RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
       (epitaxy of cobalt silicide on **silicon**
       substrate by cobalt/germanium-silicon/titanium/silicon
       multilayer solid phase reaction)
RN 12017-11-7 HCAPLUS
CN Cobalt silicide (CoSi) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **12017-12-8P**, Cobalt silicide (CoSi2)
    RL: SPN (Synthetic preparation); TEM (Technical or engineered
    material use); PREP (Preparation); USES (Uses)
       (epitaxy of cobalt silicide on **silicon**
       substrate by cobalt/germanium-silicon/titanium/silicon
       multilayer solid phase reaction)
RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

CC 76-2 (Electric Phenomena)
    Section cross-reference(s): 75
ST SPE cobalt silicide **silicon substrate** amorphous
    germanium **multilayer**
IT Diffusion barrier

Multilayers
Rapid thermal annealing
Sheet resistance
Siliconizing
Solid phase epitaxy
Thickness
(epitaxy of cobalt silicide on **silicon substrate** by cobalt/germanium-silicon/titanium/silicon **multilayer** solid phase reaction)

IT Electric resistance
(germanium-silicon; epitaxy of cobalt silicide on **silicon substrate** by cobalt/germanium-silicon/titanium/silicon **multilayer** solid phase reaction)

IT **7440-21-3**, Silicon, processes 7440-32-6, Titanium, processes 7440-48-4, Cobalt, processes **37232-85-2**, Germanium 15, silicon 85 (atomic)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(epitaxy of cobalt silicide on **silicon substrate** by cobalt/germanium-silicon/titanium/silicon **multilayer** solid phase reaction)

IT **12017-11-7**, Cobalt silicide (CoSi) 12052-56-1, Cobalt titanium silicide (Co3Ti2Si) 61179-90-6, Cobalt titanium oxide (Co2Ti4O)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(epitaxy of cobalt silicide on **silicon substrate** by cobalt/germanium-silicon/titanium/silicon **multilayer** solid phase reaction)

IT **12017-12-8P**, Cobalt silicide (CoSi2)
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(epitaxy of cobalt silicide on **silicon substrate** by cobalt/germanium-silicon/titanium/silicon **multilayer** solid phase reaction)

L29 ANSWER 11 OF 34 HCAPLUS

ACCESSION NUMBER: 2003:50434 HCAPLUS
DOCUMENT NUMBER: 138:359668
TITLE: Femtosecond pump-probe nondestructive examination of materials (invited)
AUTHOR(S): Norris, Pamela M.; Caffrey, Andrew P.; Stevens, Robert J.; Klopf, J. Michael; McLeskey, James T., Jr.; Smith, Andrew N.
CORPORATE SOURCE: Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, VA, 22904, USA
SOURCE: Review of Scientific Instruments (2003), 74(1, Pt. 2), 400-406
CODEN: RSINAK; ISSN: 0034-6748
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Ultrashort-pulsed lasers were demonstrated as effective tools for the nondestructive examn. (NDE) of energy transport properties in thin films. After the instantaneous heating of the surface of a 100. nm **metal film**, it will take .apprx.100 ps for the influence of the substrate to affect the surface temp. profile. Therefore, direct measurement of energy transport in a thin film sample requires a technique with picosecond temporal

resoln. The pump-probe exptl. technique is able to monitor the change in reflectance or transmittance of the sample surface as a function of time on a subpicosecond time scale. Changes in reflectance and transmittance can then be used to det. properties of the film. In the case of metals, the change in reflectance is related to changes in temp. and strain. The transient temp. profile at the surface is then used to det. the rate of coupling between the electron and phonon systems as well as the thermal cond. of the material. In the case of semiconductors, the change in reflectance and transmittance is related to changes in the local electronic states and temp. Transient thermotransmission expts. were used extensively to observe electron-hole recombination phenomena and thermalization of hot electrons. Application of the transient thermoreflectance (TTR) and transient thermotransmittance (TTT) technique to the study of picosecond phenomena in metals and semiconductors are discussed. The pump-probe exptl. setup will be described, along with the details of the exptl. app. in use at the University of Virginia. The thermal model applicable to ultrashort-pulsed laser heating of metals will be presented along with a discussion of the limitations of this model. Details of the data acquisition and interpretation of the exptl. results will be given, including a discussion of the reflectance models used to relate the measured changes in reflectance to calcd. changes in temp. Finally, exptl. results will be presented that demonstrate the use of the TTR technique for measuring the electron-phonon coupling factor and the thermal cond. of thin **metallic films.** The use of the TTT technique to distinguish between different levels of doping and alloying in thin film samples of hydrogenated amorphous Si will also be discussed briefly.

IT **7440-21-3**, Silicon, properties **11148-21-3**
RL: PRP (Properties)
(hydrogenated; femtosecond pump-probe nondestructive examn. of)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 69

ST pump optical probe material thermal cond energy transfer; platinum **multilayer** gold optical pump probe conductive energy transfer; hydrogenated germanium silicon optical pump probe conductive energy transfer

IT **Multilayers**
(femtosecond pump-probe nondestructive examn. of materials with metal)

IT **7440-21-3**, Silicon, properties **11148-21-3**
RL: PRP (Properties)

(hydrogenated; femtosecond pump-probe nondestructive examn. of)
REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 12 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:814606 HCAPLUS
DOCUMENT NUMBER: 137:319080
TITLE: MOSFET integrated circuit with thin film having high permittivity and uniform thickness
INVENTOR(S): Yamamoto, Ichiro
PATENT ASSIGNEE(S): NEC Corp., Japan
SOURCE: U.S. Pat. Appl. Publ., 20 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2002153579	A1	20021024	US 2002-125370		20020419
JP 2002314072	A2	20021025	JP 2001-120485		20010419
PRIORITY APPLN. INFO.:			JP 2001-120485	A	20010419

AB The invention relates to a MOSFET integrated circuit with a thin film having a high dielec. const. and uniform film thickness. The semiconductor device comprises, in an embodiment, an electrode which is made of a metal or a metal nitride and which is formed on a silicon layer via a dielec. film. The dielec. film has a **multi-layer** structure comprising an amorphous oxide film on the side of the silicon **layer** and a **metal** oxide **film** on the side of the electrode. In another embodiment, the semiconductor device comprises an electrode which is made of silicon (Si) or a silicon germanium (SiGe) and which is formed on a silicon layer via a dielec. film. In such case, the dielec. film has a **multilayer** structure comprising a first amorphous oxide film on the side of the silicon layer, a second amorphous oxide film on the side of the electrode, and a **metal** oxide **film** between the first and second amorphous oxide films.

IT **7440-21-3**, Silicon, processes **11148-21-3**
RL: DEV (Device component use); EPR (Engineering process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(MOSFET integrated circuit with thin film having high permittivity and uniform thickness)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM H01L029-76
ICS H01L021-336; H01L029-94; H01L031-062; H01L031-113; H01L021-3205
INCL 257412000
CC 76-3 (Electric Phenomena)
IT 1314-23-4, Zirconia, processes 1344-28-1, Alumina, processes
7440-21-3, Silicon, processes 7631-86-9, Silica, processes
11148-21-3
RL: DEV (Device component use); EPR (Engineering process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(MOSFET integrated circuit with thin film having high permittivity and uniform thickness)

L29 ANSWER 13 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:690110 HCAPLUS
DOCUMENT NUMBER: 135:234772
TITLE: Forming a conductive **multilayer** structure in a semiconductor device
INVENTOR(S): Weimer, Ronald A.; Hu, Yongjun Jeff; Pan, Pai Hung; Ratakonda, Deepa; Beck, James; Thakur, Randhir P. S.
PATENT ASSIGNEE(S): Micron Technology, Inc., USA
SOURCE: U.S., 12 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 6291868	B1	20010918	US 1998-31407		19980226
US 2001014522	A1	20010816	US 1999-397763		19990915
US 6362086	B2	20020326			
US 6596595	B1	20030722	US 2000-620442		20000720
US 2003207556	A1	20031106	US 2003-454218		20030604
US 6849544	B2	20050201			
PRIORITY APPLN. INFO.:			US 1998-31407	A3	19980226

US 1999-397763	A1	19990915
US 2000-620442	A1	20000720

AB A conductive structure for use in a semiconductor device includes a **multilayer** structure. A 1st layer includes a material contg. Si, e.g., polysilicon and Si-Ge. A barrier layer is formed over the 1st layer, with the barrier **layer** including **metal** silicide or metal silicide nitride. A top conductive layer is formed over the barrier layer. The top conductive **layer** can include **metal** or metal silicide. Selective oxidn. can be performed to reduce the amt. of oxidn. of selected materials in a structure contg. **multiple layers**, such as the **multilayer** conductive structure. The selective oxidn. was performed in a single-wafer rapid thermal processing system, in which a selected ambient, including H, was used to ensure low oxidn. of a selected material, such as W or a metal nitride.

IT **7440-21-3**, Silicon, processes **11104-62-4**, Cobalt silicide **11148-21-3** **12035-57-3**, Nickel silicide (NiSi) **12738-91-9**, Titanium silicide **39467-10-2**, Nickel silicide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming conductive **multilayer** structure in semiconductor device)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11104-62-4 HCAPLUS
CN Cobalt silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	x	7440-48-4
Si	x	7440-21-3

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12035-57-3 HCAPLUS
CN Nickel silicide (NiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Ni═Si

RN 12738-91-9 HCAPLUS
CN Titanium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	x	7440-32-6
Si	x	7440-21-3

RN 39467-10-2 HCAPLUS
CN Nickel silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	x	7440-21-3
Ni	x	7440-02-0

IC ICM H01L029-76
INCL 257413000
CC 76-2 (Electric Phenomena)
ST conductor **multilayer** silicide nitride
IT Films
(elec. conductive; forming conductive **multilayer** structure in semiconductor device)
IT Electric conductors
(films; forming conductive **multilayer** structure in semiconductor device)
IT Diffusion barrier
Electric conductors
Multilayers
(forming conductive **multilayer** structure in semiconductor device)
IT Metals, processes
Transition metal nitrides
Transition metal silicides
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming conductive **multilayer** structure in semiconductor device)
IT Transition metal nitrides
Transition metal silicides
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(nitride silicides; forming conductive **multilayer** structure in semiconductor device)
IT Oxidation
(selective; forming conductive **multilayer** structure in semiconductor device)
IT **7440-21-3**, Silicon, processes 7440-33-7, Tungsten, processes **11104-62-4**, Cobalt silicide 11104-85-1, Molybdenum silicide **11148-21-3 12035-57-3**, Nickel silicide (NiSi) **12738-91-9**, Titanium silicide 39336-13-5, Niobium silicide **39467-10-2**, Nickel silicide 60304-33-8, Hafnium silicide
RL: DEV (Device component use); PEP (Physical, engineering or

chemical process); PROC (Process); USES (Uses)
(forming conductive **multilayer** structure in semiconductor device)

IT 1333-74-0, Hydrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(forming conductive **multilayer** structure in semiconductor device)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 14 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:598452 HCAPLUS
DOCUMENT NUMBER: 135:160980
TITLE: Forming a conductive structure **multilayer** including metal silicides in a semiconductor device
INVENTOR(S): Weimer, Ronald A.; Hu, Yongjun Jeff; Pan, Pai Hung; Ratakonda, Deepa; Beck, James; Thakur, Randhir P. S.
PATENT ASSIGNEE(S): Micron Technology, Inc., USA
SOURCE: U.S. Pat. Appl. Publ., 12 pp., Division of U.S. Ser. No. 31,407.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2001014522	A1	20010816	US 1999-397763		19990915
US 6362086	B2	20020326			
US 6291868	B1	20010918	US 1998-31407		19980226
US 6596595	B1	20030722	US 2000-620442		20000720
US 2003207556	A1	20031106	US 2003-454218		20030604
US 6849544	B2	20050201			
PRIORITY APPLN. INFO.:			US 1998-31407	A3	19980226
			US 1999-397763	A1	19990915
			US 2000-620442	A1	20000720

AB A conductive structure for use in a semiconductor device includes a **multilayer** structure. A 1st layer includes a material

contg. Si, e.g., polysilicon and Si germanide. A barrier layer is formed over the 1st layer, with the barrier **layer** including **metal** silicide or metal silicide nitride. A top conductive layer is formed over the barrier layer. The top conductive **layer** can include **metal** or metal silicide. Selective oxidn. can be performed to reduce the amt. of oxidn. of selected materials in a structure contg. **multiple layers**, such as the **multilayer** conductive structure. The selective oxidn. was performed in a single-wafer rapid thermal processing system, in which a selected ambient, including H, was used to ensure low oxidn. of a selected material, such as W or a metal nitride.

IT **7440-21-3**, Silicon, processes **11148-21-3**
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IT **11104-62-4P**, Cobalt silicide **11113-78-3P**, Palladium silicide **12738-91-9P**, Titanium silicide **39467-10-2P**, Nickel silicide
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)

RN 11104-62-4 HCAPLUS
CN Cobalt silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	x	7440-48-4
Si	x	7440-21-3

RN 11113-78-3 HCAPLUS
CN Palladium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	x	7440-21-3
Pd	x	7440-05-3

RN 12738-91-9 HCAPLUS
CN Titanium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	x	7440-32-6
Si	x	7440-21-3

RN 39467-10-2 HCAPLUS
CN Nickel silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	x	7440-21-3
Ni	x	7440-02-0

IC ICM H01L021-3205
ICS H01L021-4763; H01L021-44
INCL 438591000
CC 76-2 (Electric Phenomena)
ST conductor **multilayer** silicide nitride semiconductor device
IT Vapor deposition process
(chem.; forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Films
(elec. conductive; forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Electric conductors
(films; forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Diffusion barrier
Electric conductors
Semiconductor devices
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Transition metals, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Transition metal silicides
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Transition metal nitrides
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Transition metal nitrides
Transition metal silicides
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(nitride silicides; forming conductive structure **multilayer** including metal silicides in semiconductor

device)
IT Vapor deposition process
(phys.; forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT Oxidation
(selective; forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT 1333-74-0, Hydrogen, uses 7732-18-5, Water, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT 302-01-2, Hydrazine, processes 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT **7440-21-3**, Silicon, processes 7440-33-7, Tungsten, processes **11148-21-3**
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)
IT **11104-62-4P**, Cobalt silicide **11113-78-3P**, Palladium silicide **12738-91-9P**, Titanium silicide **39467-10-2P**, Nickel silicide
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(forming conductive structure **multilayer** including metal silicides in semiconductor device)

L29 ANSWER 15 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:400628 HCAPLUS
DOCUMENT NUMBER: 135:160574
TITLE: Three-dimensional nano-objects evolving from a two-dimensional layer technology
AUTHOR(S): Schmidt, Oliver G.; Schmarje, Nicole; Deneke, Christoph; Muller, Claudia; Jin-Phillipp, Neng-Yun
CORPORATE SOURCE: Max-Planck-Institut fur Festkorperforschung, Stuttgart, D-70569, Germany
SOURCE: Advanced Materials (Weinheim, Germany) (2001), 13(10), 756-759
CODEN: ADVMEW; ISSN: 0935-9648
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Nanotubes were formed from a thin solid film which is peeled off from the substrate by a selective etching procedure. The rolling up of the film is caused by an inherently built-in strain. In this way, self-erecting, vertical, ultrathin SiGe membranes were fabricated. A **multilayer** structure is deposited on a **Si**(001) **substrate** by MBE. It consists of a Ge sacrificial buffer layer and 2 SiGe layers with different amts. of Ge. The etchant soln. (H2O2/H2O) is introduced through a slit on the sample surface. The microstructure of the samples was investigated by SEM. The built-in strain in the SiGe bilayer was further utilized by sepg. the free-standing membranes from their base. In this way, a ring-like, vertical membrane is formed on the

substrate surface. The nanofabrication process was also used for the prodn. of a multi-wall InGaAs nanotube rolled up from a GaAs(001) substrate. Furthermore, it was possible to combine different materials in a single nanotube, which was demonstrated for a nanotube the walls of which contained semiconductor (SiGe), insulator (SiO2), and **metal** (Ti) **layers.**

IT **11148-21-3**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(prodn. of SiGe nanotubes evolving from a 2D layer technol.)
RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IT **37380-03-3**, germanium 20, silicon 80 (atomic)
76998-02-2, germanium 40, silicon 60 (atomic)
83573-93-7, germanium 70, silicon 30 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(prodn. of SiGe/SiOx/Ti nanotubes evolving from a 2D layer technol. on Ge buffer)
RN 37380-03-3 HCAPLUS
CN Silicon alloy, base, Si 61,Ge 39 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	61	7440-21-3
Ge	39	7440-56-4

RN 76998-02-2 HCAPLUS
CN Germanium alloy, base, Ge 63,Si 37 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	63	7440-56-4
Si	37	7440-21-3

RN 83573-93-7 HCAPLUS
CN Germanium alloy, base, Ge 86,Si 14 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	86	7440-56-4
Si	14	7440-21-3

IT **7440-21-3**, **Silicon**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**substrate**; prodn. of SiGe nanotubes evolving from a 2D layer technol.)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

CC 76-2 (Electric Phenomena)
IT **11148-21-3**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(prodn. of SiGe nanotubes evolving from a 2D layer technol.)
IT 7440-32-6, Titanium, properties 7440-56-4, Germanium, properties 7631-86-9, Silica, properties **37380-03-3**, germanium 20, silicon 80 (atomic) **76998-02-2**, germanium 40, silicon 60 (atomic) **83573-93-7**, germanium 70, silicon 30 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(prodn. of SiGe/SiOx/Ti nanotubes evolving from a 2D layer technol. on Ge buffer)
IT **7440-21-3**, **Silicon**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**substrate**; prodn. of SiGe nanotubes evolving from a 2D layer technol.)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 16 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:150628 HCAPLUS
DOCUMENT NUMBER: 134:200314
TITLE: Efficient silicon-germanium infrared detectors
INVENTOR(S): Presting, Hartmut; Jaros, Milan
PATENT ASSIGNEE(S): Daimlerchrysler A.-G., Germany
SOURCE: Ger. Offen., 6 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19941304	A1	20010301	DE 1999-19941304	19990831
PRIORITY APPLN. INFO.:			DE 1999-19941304	19990831

AB **Multilayer** structures for IR detectors are described which comprise a **Si substrate**, a lightly doped Si layer, an intrinsic first Si1-xGex epitaxial layer, a heavily doped second Si1-xGex epitaxial layer, another intrinsic third Si1-xGex epitaxial **layer**, and a **metal** (e.g., Al) contact. The third Si1-xGex epitaxial layer acts as a dopant setback layer , producing a gap in the charge carrier flow from the metal to the semiconductor ad resulting in ballistic carrier injection. This reduces the dark current and increases the efficiency of the detector.
IT **7440-21-3**, Silicon, uses **12623-02-8**, Germanium 50, silicon 50 (atomic) **12623-04-0**, Germanium 30, silicon 70

(atomic)
RL: DEV (Device component use); USES (Uses)
(silicon-germanium IR detectors with ballistic carrier injection)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12623-02-8 HCAPLUS
CN Germanium alloy, base, Ge 72,Si 28 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	72	7440-56-4
Si	28	7440-21-3

RN 12623-04-0 HCAPLUS
CN Germanium alloy, base, Ge 53,Si 47 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	53	7440-56-4
Si	47	7440-21-3

IC ICM H01L031-109
ICS G01J005-20
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
IT 7429-90-5, Aluminum, uses **7440-21-3**, Silicon, uses
12623-02-8, Germanium 50, silicon 50 (atomic)
12623-04-0, Germanium 30, silicon 70 (atomic)
RL: DEV (Device component use); USES (Uses)
(silicon-germanium IR detectors with ballistic carrier injection)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 17 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:881466 HCAPLUS
DOCUMENT NUMBER: 134:35989
TITLE: Non-volatile semiconductor memory cell, comprising a metal-oxide dielectric, and a method for producing the same.
INVENTOR(S): Ludwig, Christoph; Schrems, Martin
PATENT ASSIGNEE(S): Infineon Technologies A.-G., Germany
SOURCE: PCT Int. Appl., 29 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

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     WO 2000075997        A1    20001214    WO 2000-DE1866
                                                                  200006
                                                                  06
         W:  JP, KR, US
         RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,
             NL, PT, SE
     DE 19926108          A1    20001221    DE 1999-19926108
                                                                  199906
                                                                  08
     EP 1183735           A1    20020306    EP 2000-947793
                                                                  200006
                                                                  06
     EP 1183735           B1    20051019
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
             PT, IE, FI
     US 2002093858        A1    20020718    US 2001-13271
                                                                  200112
                                                                  10
     US 6580118           B2    20030617
PRIORITY APPLN. INFO.:                      DE 1999-19926108    A
                                                                  199906
                                                                  08

                                            WO 2000-DE1866      W
                                                                  200006
                                                                  06
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AB The invention relates to a nonvolatile semiconductor memory cell and a method for producing the same. In the method, a conventional, dielec. ONO layer is replaced by an extremely thin **metal** -oxide **layer**, consisting of WOx and/or TiO2. An addnl. improvement in the integration d. and the control voltage necessary for the semiconductor memory cell is achieved as a result of the high relative dielec. const. of these materials.

IT **7440-21-3**, Silicon, processes **11148-21-3**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(non-volatile semiconductor memory cell, comprising a metal-oxide dielec., and a method for producing the same.)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM H01L029-51
ICS H01L029-788
CC 76-3 (Electric Phenomena)
ST nonvolatile semiconductor memory cell metal oxide dielec prodn;

metal oxide **layer** improvement integration density control voltage EPROM

IT Dielectric constant
Electric insulators
Electric potential
Etching
Multilayers
SOI devices
Semiconductor memory devices
Sputtering
Volatility
(non-volatile semiconductor memory cell, comprising a metal-oxide dielec., and a method for producing the same.)

IT 7440-32-6, Titanium, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**metal layer**; non-volatile semiconductor memory cell, comprising a metal-oxide dielec., and a method for producing the same.)

IT 78-10-4, TEOS 409-21-2, Silicon carbide, processes 1303-00-0, Gallium arsenide, processes **7440-21-3**, Silicon, processes 7440-33-7, Tungsten, processes 7631-86-9, Silica, processes **11148-21-3** 12033-89-5, Silicon nitride (Si3N4), processes 12627-41-7, Tungsten silicide 13463-67-7, Titania, processes 25583-20-4, Titanium nitride 37359-53-8, Tungsten nitride
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(non-volatile semiconductor memory cell, comprising a metal-oxide dielec., and a method for producing the same.)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 18 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:877063 HCAPLUS
DOCUMENT NUMBER: 134:65332
TITLE: Perpendicular magnetic recording medium and magnetic recording/reproduction apparatus
INVENTOR(S): Nimoto, Masaaki; Honda, Yukio; Hirayama, Yoshiyuki; Kikukawa, Atsushi; Yoshida, Kazuyoshi
PATENT ASSIGNEE(S): Hitachi, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000348327	A2	20001215	JP 1999-162024	19990609

PRIORITY APPLN. INFO.: JP 1999-162024 19990609

AB In a perpendicular magnetic recording medium having a perpendicular magnetization film formed on a non-magnetic substrate via an underlayer magnetic film, the underlayer magnetic film comprises a **multilayer** film of ≥3 layers of a magnetic film(s) and non-magnetic film(s) of an alloy based on Ti, Hf, Zr, or Mn, **Si**, Ge, semimetal **based** on **Si** or Ge, or a compd. selected from an oxide, carbide, boride, or nitride. Specifically, the compd. may comprise SiO_2, Al_2O_3, ZrO_2, MgO, CaO, and the magnetic film may comprise Co-Nb-X (X=Zr, Ti, Hf, Mo, W), Ni-Co-Y (Y=Zr, Ti, Hf, Mo, W), or Fe-Si-Z (Z=B, Al). A high-speed and high-d. magnetic recording/reprodn. app. comprising the above medium is also described.

IT **7440-21-3**, Silicon, uses **12674-90-7**, Iron 98, silicon 2 (atomic) **37214-91-8**, Germanium 25, silicon 75 (atomic) **37255-61-1**, Iron 95, silicon 5 (atomic) **72048-89-6**, Germanium 80, silicon 20 (atomic)
RL: DEV (Device component use); USES (Uses)
(**multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12674-90-7 HCAPLUS
CN Iron alloy, base, Fe 99,Si 1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	99	7439-89-6
Si	1	7440-21-3

RN 37214-91-8 HCAPLUS
CN Silicon alloy, base, Si 54,Ge 46 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	54	7440-21-3
Ge	46	7440-56-4

RN 37255-61-1 HCAPLUS
CN Iron alloy, base, Fe 97,Si 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	97	7439-89-6
Si	2.6	7440-21-3

RN 72048-89-6 HCAPLUS
CN Germanium alloy, base, Ge 91,Si 8.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	91	7440-56-4

Si 8.8 7440-21-3

IC ICM G11B005-667
CC 77-8 (Magnetic Phenomena)
ST magnetic recording app **multilayer** film underlayer
IT Magnetic films
Magnetic memory devices
(**multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)
IT Films
(**multilayer**; **multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)
IT 12446-11-6, Aluminum zirconium oxide Al2ZrO5
RL: DEV (Device component use); USES (Uses)
(Al2O3•ZrO2; **multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)
IT 104244-64-6, Calcium magnesium oxide CaMgO2
RL: DEV (Device component use); USES (Uses)
(MgO•CaO; **multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)
IT 409-21-2, Silicon carbide, uses 1305-78-8, Calcium oxide (CaO), uses 1309-48-4, Magnesium oxide (MgO), uses 1314-23-4, Zirconium oxide (ZrO2), uses 1344-28-1, Alumina, uses 7439-96-5, Manganese, uses **7440-21-3**, Silicon, uses 7440-32-6, Titanium, uses 7440-56-4, Germanium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses 7631-86-9, Silica, uses 10101-39-0 10101-52-7 11148-13-3, Iron 20, nickel 80 (atomic) 12007-23-7, Hafnium diboride 12008-21-8, Lanthanum boride 12033-89-5, Silicon nitride, uses 12045-63-5, Titanium diboride 12045-64-6, Zirconium diboride 12069-32-8, Boron carbide (B4C) 12069-85-1, Hafnium carbide 12070-08-5, Titanium carbide 12070-14-3, Zirconium carbide 12621-05-5, Chromium 5, germanium 95 (atomic) **12674-90-7**, Iron 98, silicon 2 (atomic) 14504-95-1 25583-20-4, Titanium nitride 25658-42-8, Zirconium nitride 25817-87-2, Hafnium nitride **37214-91-8**, Germanium 25, silicon 75 (atomic) **37255-61-1**, Iron 95, silicon 5 (atomic) 37274-26-3, Iron 50, platinum 50 (atomic) 53801-50-6, Yttrium boride **72048-89-6**, Germanium 80, silicon 20 (atomic) 80579-44-8, Chromium 30, zirconium 70 (atomic) 87931-85-9, Cobalt 90, hafnium 3, niobium 7 (atomic) 97793-35-6, Cerium boride 99150-20-6, Hafnium 45, zirconium 55 (atomic) 106698-99-1, Titanium carbide nitride (TiC0.7N0.3) 121229-13-8, Iron 60, platinum 40 (atomic) 137670-59-8, Cobalt 90, niobium 5, zirconium 5 (atomic) 149570-43-4, Hafnium 30, titanium 70 (atomic) 156356-99-9, Cobalt 55, platinum 45 (atomic) 177575-08-5, Manganese 90, zirconium 10 (atomic) 186888-91-5, Chromium 15, cobalt 70, platinum 15 (atomic) 208260-58-6, Chromium 20, cobalt 70, platinum 10 (atomic) 208260-62-2, Chromium 16, cobalt 81, tantalum 3 (atomic) 223516-48-1, Manganese 3, silicon 97 (atomic) 224314-61-8, Titanium zirconium boride (Ti0.8Zr0.2B2) 313519-07-2, Manganese 5, silicon 95 (atomic) 313519-08-3, Cobalt 91, hafnium 3, niobium 6 (atomic) 313519-10-7, Chromium 19, cobalt 70, platinum 8, tantalum 3 (atomic) 313519-12-9, Cobalt 18, samarium 82 (atomic) 313519-14-1, Boron 3, iron 20, neodymium 77 (atomic) 313519-15-2, Cobalt 25, nickel 71, zirconium 4 (atomic) 313519-17-4, Chromium 35, titanium 65 (atomic) 313519-19-6, Cobalt 91, molybdenum 3, niobium 6 (atomic) 313519-21-0, Chromium 17,

cobalt 79, tantalum 3, yttrium 1 (atomic) 313519-23-2, Cobalt 82, niobium 5, titanium 3 (atomic) 313519-25-4, Cobalt 92, hafnium 3, niobium 5 (atomic) 313519-27-6, Cobalt 94, niobium 4, tungsten 2 (atomic) 313519-29-8, Cobalt 10, nickel 88, zirconium 2 (atomic) 313519-31-2, Cobalt 28, nickel 69, titanium 3 (atomic) 313519-33-4, Cobalt 5, hafnium 4, nickel 91 (atomic) 313519-35-6, Cobalt 7, molybdenum 3, nickel 90 (atomic) 313519-37-8, Cobalt 15, nickel 83, tungsten 2 (atomic) 313519-39-0, Boron 2, iron 95, silicon 3 (atomic) 313519-41-4, Aluminum 3, iron 93, silicon 4 (atomic) 313519-44-7, Chromium 20, cobalt 70, platinum 8, tantalum 2 (atomic)

RL: DEV (Device component use); USES (Uses)
(**multilayer** film for underlayer of perpendicular magnetic recording medium and magnetic recording/reprodn. app.)

L29 ANSWER 19 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:737091 HCAPLUS
DOCUMENT NUMBER: 133:289974
TITLE: Channel design to reduce impact ionization in heterostructure field-effect transistors
INVENTOR(S): Boos, J. Brad; Yang, Ming-jey; Bennett, Brian R.; Park, Doewon; Kruppa, Walter
PATENT ASSIGNEE(S): United States Dept. of the Navy, USA
SOURCE: U.S., 9 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6133593	A	20001017	US 1999-358649	19990723
PRIORITY APPLN. INFO.:			US 1999-358649	19990723

AB Heterostructure field-effect transistors (HFETs) and other electronic devices are fabricated from semiconductor layers to have reduced impact ionization. On to a 1st barrier layer there is added a unique 2nd sub-channel layer having high quality transport properties for reducing impact ionization. A 3rd barrier layer having a controlled thickness to permit electrons to tunnel through the layer to the sub-channel layer is added as a spacer for the 4th main channel layer. A 5th **multilayer** composite barrier layer is added which has at least a barrier layer in contact with the 4th channel layer and on top a 6th cap layer is applied. The device is completed by adding two ohmic contacts in a spaced apart relation on the 6th cap layer with a Schottky gate between them which is formed in contact with the 5th barrier layer. The 2nd sub-channel layer and the 4th main channel layers are made of materials which have the proper resp. energy gaps and ground state energies such that during use the transfer of hot electrons from the main channel into the sub-channel is made probable to reduce impact ionization in the main channel. In the preferred AlSb/InAs-based HFETs, the use of an Is InAs sub-channel layer under the main InAs channel improves the performance of the HEMTs particularly for gate

lengths in the deep-submicron regime. The devices exhibit higher transconductance, lower output conductance, reduced gate leakage current, higher operating drain voltage, and improved frequency performance.

IT **7440-21-3**, Silicon, processes
RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in fabrication of heterostructure field-effect transistors)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **11129-80-9**, Platinum silicide **11148-21-3**
12738-91-9, Titanium silicide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in fabrication of heterostructure field-effect transistors)

RN 11129-80-9 HCAPLUS

CN Platinum silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	x	7440-21-3
Pt	x	7440-06-4

RN 11148-21-3 HCAPLUS

CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12738-91-9 HCAPLUS

CN Titanium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	x	7440-32-6
Si	x	7440-21-3

IC ICM H01L029-778

INCL 257194000

CC 76-3 (Electric Phenomena)

IT **7440-21-3**, Silicon, processes
RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in fabrication of heterostructure field-effect transistors)

IT 1303-00-0, Gallium arsenide (GaAs), processes 1303-11-3, Indium arsenide (InAs), processes 1312-41-0 7440-05-3, Palladium, processes 7440-06-4, Platinum, processes 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes 7440-47-3, Chromium,

processes 7440-57-5, Gold, processes **11129-80-9**, Platinum silicide **11148-21-3** 12064-03-8 12070-08-5, Titanium carbide **12738-91-9**, Titanium silicide 22398-80-7, Indium phosphide (InP), processes 25152-52-7 25617-97-4, Gallium nitride (GaN) 37382-15-3, Aluminum gallium arsenide (Al0-1Ga0-1As) 51680-21-8, Aluminum antimony gallium arsenide ((Al,Ga)(Sb,As)) 106070-23-9, Aluminum indium arsenide (Al0-1In0-1As) 106070-25-1, Gallium indium arsenide (Ga0-1In0-1As) 106097-44-3, Aluminum gallium nitride (Al0-1Ga0-1N) 106604-03-9, Antimony indium phosphide (Sb0-1InP0-1) 113959-17-4, Aluminum antimony phosphide (Al(Sb,P)) 114103-97-8, Aluminum indium arsenide (Al0.6In0.4As) 115184-93-5 117944-21-5, Aluminum antimony indium arsenide ((Al,In)(Sb,As))
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in fabrication of heterostructure field-effect transistors)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 20 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:552996 HCAPLUS
DOCUMENT NUMBER: 133:171034
TITLE: Complimentary MIS semiconductor device and its fabrication
INVENTOR(S): Mokami, Toru
PATENT ASSIGNEE(S): NEC Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000223588	A2	20000811	JP 1999-26662	19990203
PRIORITY APPLN. INFO.:			JP 1999-26662	19990203

AB A complimentary MIS semiconductor device comprises gate electrodes from a **multilayer** structure of conductor films having different work functions to give suitable threshold voltages: bottom conductor films having a thickness thin enough to change channel potentials. A method for fabricating the above device is also described.

IT **7440-21-3**, Silicon, processes **11148-21-3** **12738-91-9**, Titanium silicide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**multilayer** gate electrode of complimentary MIS semiconductor device and its fabrication)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12738-91-9 HCAPLUS
CN Titanium silicide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	x	7440-32-6
Si	x	7440-21-3

IC ICM H01L021-8238
ICS H01L027-092; H01L021-28; H01L029-43; H01L029-78
CC 76-3 (Electric Phenomena)
IT Films
Films
(elec. conductive; **multilayer** gate electrode of complimentary MIS semiconductor device and its fabrication)
IT Electric conductors
Electric conductors
(films; **multilayer** gate electrode of complimentary MIS semiconductor device and its fabrication)
IT Film electrodes
MIS devices
MISFET (transistors)
Semiconductor device fabrication
(**multilayer** gate electrode of complimentary MIS semiconductor device and its fabrication)
IT 7439-88-5, Iridium, processes 7439-98-7, Molybdenum, processes **7440-21-3**, Silicon, processes 7440-33-7, Tungsten, processes 7440-58-6, Hafnium, processes 7440-67-7, Zirconium, processes 11113-84-1, Ruthenium oxide **11148-21-3** 12627-41-7, Tungsten silicide **12738-91-9**, Titanium silicide 25583-20-4, Titanium nitride
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**multilayer** gate electrode of complimentary MIS semiconductor device and its fabrication)

L29 ANSWER 21 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:461878 HCAPLUS
DOCUMENT NUMBER: 133:273889
TITLE: Quantum well intersubband THz lasers and detectors
AUTHOR(S): Soref, Richard A.; Friedman, Lionel R.; Sun, Gregory; Noble, Michael J.; Ram-Mohan, L. R.
CORPORATE SOURCE: Sensors Directorate, Air Force Research Lab., AFRL/SHNC, Hanscom AFB, MA, USA
SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1999), 3795(Terahertz

and Gigahertz Photonics), 516-527
CODEN: PSISDG; ISSN: 0277-786X
PUBLISHER: SPIE-The International Society for Optical Engineering
DOCUMENT TYPE: Journal
LANGUAGE: English

AB This paper presents modeling and simulation results on **Si-based** quantum-well intersubband THz detectors and THz lasers (tasers) in the 3 to 10 THz range where the intersubband transition energy is 12 to 41 meV. The incoherent cryogenically cooled (4 K to 20 K) quantum well terahertz detector (QWTD) consists of p-type Si0.9Ge0.1 QWs with Si barriers on an **Si substrate** , or of p-Si0.85Ge0.15/Si on a relaxed Si0.97Ge0.03 buffer on Si. The QWTD senses THz radiation at normal incidence (the XY polarization on the HH1 to LH1 transition) or at edge- illumination (the Z polarization on the HH1 to HH2 transition). Resonant-cavity enhancement, coupling to Si THz waveguides, and integration with SiGe transistor preamplifiers appear feasible for QWTDs. The quantum staircase taser is a simplified far-IR version of the quantum cascade laser in which each superlattice transfer region is replaced by a thin tunnel-barrier layer. The authors have adapted to Group IV the III-V idea of Sun, Lu, and Khurgin; the inverted mass taser. On a Si0.81Ge0.19 substrate, an inverted effective mass exists in LH1 at kg is 0.013 Å-1 in 9-nm single- wells of Si0.7Ge0.3 with 5-nm Si barriers. Selective elec. injection of holes into LH1 at T is 77 K is postulated. This offers local-in-k-space LH1-HH1 population inversion and tasing at 7.2 THz. Since the taser emission is XY-polarized, the active MQW staircase (a set of identical square QWs) is suitable for insertion into a vertical cavity surface-emitting taser. The VCSET would have resonator thickness of λ /2n is 6 μm , and Bragg mirrors constructed from SiO2/Si **multilayers.**

IT **7440-21-3**, Silicon, properties **12017-12-8**, Cobalt disilicide **12623-04-0**, Germanium 30, silicon 70 (atomic)
37232-85-2, Germanium 15, silicon 85 (atomic)
51845-18-2, Germanium 10, silicon 90 (atomic)
119849-50-2, Germanium 97, silicon 3 (atomic)
124776-23-4, Germanium 3, silicon 97 (atomic)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(quantum well intersubband THz lasers and detectors)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 12623-04-0 HCAPLUS
CN Germanium alloy, base, Ge 53,Si 47 (9CI) (CA INDEX NAME)

Component Component Component

	Percent	Registry Number
Ge	53	7440-56-4
Si	47	7440-21-3

RN 37232-85-2 HCAPLUS
CN Silicon alloy, base, Si 69,Ge 31 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	69	7440-21-3
Ge	31	7440-56-4

RN 51845-18-2 HCAPLUS
CN Silicon alloy, base, Si 78,Ge 22 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	78	7440-21-3
Ge	22	7440-56-4

RN 119849-50-2 HCAPLUS
CN Germanium alloy, base, Ge 99,Si 1.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	99	7440-56-4
Si	1.2	7440-21-3

RN 124776-23-4 HCAPLUS
CN Silicon alloy, base, Si 93,Ge 7.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	93	7440-21-3
Ge	7.4	7440-56-4

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
IT **7440-21-3**, Silicon, properties 7631-86-9, Silica, properties **12017-12-8**, Cobalt disilicide
12623-04-0, Germanium 30, silicon 70 (atomic)
37232-85-2, Germanium 15, silicon 85 (atomic)
51845-18-2, Germanium 10, silicon 90 (atomic)
119849-50-2, Germanium 97, silicon 3 (atomic)
124776-23-4, Germanium 3, silicon 97 (atomic)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(quantum well intersubband THz lasers and detectors)
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 22 OF 34 HCAPLUS
ACCESSION NUMBER: 1998:81123 HCAPLUS
DOCUMENT NUMBER: 128:199639

TITLE: Thermoelectric materials by barrier/conductor **multilayers**
INVENTOR(S): Nishimoto, Seiji
PATENT ASSIGNEE(S): Honda Motor Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10032354	A2	19980203	JP 1996-185866	19960716
JP 3526699	B2	20040517		
US 5886292	A	19990323	US 1997-895515	19970716

PRIORITY APPLN. INFO.: JP 1996-185866 A 19960716

AB The title thermoelec. materials have an alternately laminated barrier/conductor **multilayer** by employing (a) 1st semiconductive conductor layers and (b) barrier layers which comprise (1) outer barrier layers contg. a 2nd semiconductive outer barrier layer and 1st/2nd semiconductive boundary layers and (2) inner barrier layers contg. a 2nd semiconductive outer barrier layer and 2 2nd semiconductive outer barrier layers. The thickness of the conductors (t1) and barriers (t2) has a relation as $t1 \le t2 \le 50t1$ so as to form a quantum well in each conductor layer.

IT **7440-21-3**, Silicon, properties **11148-21-3** **12022-99-0**, Iron silicide (FeSi2)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(semiconductor layer for thermoelec. **multilayer**; thermoelec. materials by barrier/conductor **multilayers**)

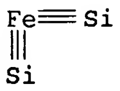
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12022-99-0 HCAPLUS
CN Iron silicide (FeSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L035-14
ICS H01L035-16; H01L035-26
CC 76-6 (Electric Phenomena)
Section cross-reference(s): 56, 57
IT Molecular surface
(boundary layer, semiconductor; thermoelec. materials by barrier/conductor **multilayers**)
IT Diffusion barrier
Quantum well heterojunctions
Thermoelectric materials
(thermoelec. materials by barrier/conductor **multilayers**
)
IT Semiconductor devices
(thermoelec.; thermoelec. materials by barrier/conductor **multilayers**)
IT **7440-21-3**, Silicon, properties **11148-21-3**
12022-99-0, Iron silicide ($FeSi_2$) 121515-47-7, Cobalt iron silicide ($Co_{0.1}Fe_{0.9}Si_2$) 159679-85-3, Iron manganese silicide ($Fe_{0.9}Mn_{0.1}Si_2$) 188921-84-8, Antimony germanium silver telluride ($Sb_{0.15}Ge_{0.85}Ag_{0.15}Te_{1.15}$) 203799-91-1, Lead sodium selenide telluride ($PbNa_{0.01}Se_{0.05}Te_{0.95}$) 203799-92-2, Europium lead telluride ($Eu_{0.07}Pb_{0.9}Te$)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(semiconductor layer for thermoelec. **multilayer**; thermoelec. materials by barrier/conductor **multilayers**)

L29 ANSWER 23 OF 34 HCAPLUS
ACCESSION NUMBER: 1998:79663 HCAPLUS
DOCUMENT NUMBER: 128:161932
TITLE: Thermoelectric materials
INVENTOR(S): Nishimoto, Kiyoji
PATENT ASSIGNEE(S): Honda Motor Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 10032355	A2	19980203	JP 1996-204167		19960716
JP 3502724	B2	20040302			
US 5922988	A	19990713	US 1997-895378		19970716
PRIORITY APPLN. INFO.:			JP 1996-204167	A	19960716

AB The material consists of an alternate **multilayer** from a conductive and a barrier semiconductor layer with formation of the interfaces between the layers to coarse surfaces having a ratio of the max. height of protrusions to the thickness of the barrier layer ≥0.1. The material has good performance at an increased operating temp.

IT **7440-21-3**, Silicon, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(film; for barrier layers of thermoelec. alternate **multilayers**)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **39300-22-6**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(film; for semiconductor conductive layers of thermoelec. alternate **multilayers**)

RN 39300-22-6 HCAPLUS
CN Silicon alloy, base, Si 80,Ge 20 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	80	7440-21-3
Ge	20	7440-56-4

IT **11148-21-3 12022-99-0**, Iron silicide (FeSi2)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(film; for thermoelec. semiconductor conductor-barrier alternate **multilayers**)

RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12022-99-0 HCAPLUS
CN Iron silicide (FeSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)

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Fe≡Si
|||
Si
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IC ICM H01L035-14
ICS H01L035-16; H01L035-26

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CC   76-6 (Electric Phenomena)
     Section cross-reference(s): 56, 57
ST   thermoelec alternate conductor barrier semiconductor
     multilayer
IT   Semiconductor materials
        (diffusion barriers; for formation of semiconductor
        conductor-barrier alternate multilayer thermoelec.
        materials)
IT   Electric conductors
     Sputtering
        (for formation of semiconductor conductor-barrier alternate
        multilayer thermoelec. materials)
IT   Thermoelectric materials
        (semiconductor conductor-barrier alternate multilayers
        with coarse surface interfaces)
IT   Diffusion barrier
        (semiconductor; for formation of semiconductor conductor-barrier
        alternate multilayer thermoelec. materials)
IT   7440-21-3, Silicon, properties
     RL: PEP (Physical, engineering or chemical process); PRP
     (Properties); TEM (Technical or engineered material use); PROC
     (Process); USES (Uses)
        (film; for barrier layers of thermoelec. alternate
        multilayers)
IT   39300-22-6
     RL: PEP (Physical, engineering or chemical process); PRP
     (Properties); TEM (Technical or engineered material use); PROC
     (Process); USES (Uses)
        (film; for semiconductor conductive layers of thermoelec.
        alternate multilayers)
IT   1304-82-1, Bismuth telluride 11148-21-3 12022-99-0
     , Iron silicide (FeSi2)   39280-96-1, Lead telluride
     RL: PEP (Physical, engineering or chemical process); PRP
     (Properties); TEM (Technical or engineered material use); PROC
     (Process); USES (Uses)
        (film; for thermoelec. semiconductor conductor-barrier alternate
        multilayers)

L29  ANSWER 24 OF 34  HCAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:        1998:79662  HCAPLUS
DOCUMENT NUMBER:         128:161931
TITLE:                   Thermoelectric materials
INVENTOR(S):             Nishimoto, Kiyoji; Kitayama, Taku; Fujisawa,
                         Yoshikazu
PATENT ASSIGNEE(S):      Honda Motor Co., Ltd., Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 5 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------
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     JP 10032353          A2    19980203    JP 1996-185865
                                                                   199607
                                                                   16
     JP 3497328          B2     20040216
PRIORITY APPLN. INFO.:                      JP 1996-185865
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199607
16

AB The material consists of an alternate **multilayer** from a conductive and a barrier semiconductor layer with interleaves of diffusion barrier layers there-between. The 1st semiconductor may be a FeSi2-, Si-Ge-, PbTe-, or BiTe-system substance, the 2nd semiconductor may be Si, or FeSi2-, Si-Ge-, or PbTe-system substance, and the barrier layer may be SiO, SiO2, TiO2, FeO, Fe2O3, SnO2, In2O3, CaMnO3, SiC, Si-B, or B4C.

IT **7440-21-3**, Silicon, properties
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(film; for semiconductor conductive layers in thermoelec. alternate **multilayers**)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **11148-21-3 12022-99-0**, Iron silicide (FeSi2)
39300-22-6
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(film; for thermoelec. semiconductor conductor-barrier alternate **multilayers**)

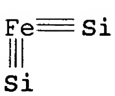
RN 11148-21-3 HCAPLUS

CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

RN 12022-99-0 HCAPLUS

CN Iron silicide (FeSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 39300-22-6 HCAPLUS

CN Silicon alloy, base, Si 80,Ge 20 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	80	7440-21-3
Ge	20	7440-56-4

IC ICM H01L035-14
ICS H01L035-16; H01L035-26

CC 76-6 (Electric Phenomena)
Section cross-reference(s): 57

ST thermoelec alternate **multilayer** diffusion barrier

IT Semiconductor materials
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(diffusion barrier; for prepn. of semiconductor conductor-barrier alternate **multilayer** thermoelec. materials)
IT Diffusion barrier
Sputtering
(for prepn. of semiconductor conductor-barrier alternate **multilayer** thermoelec. materials)
IT Thermoelectric materials
(semiconductor conductor-barrier alternate **multilayers** with diffusion barrier interleaves)
IT 409-21-2, Silicon carbide, properties 1309-37-1, Iron oxide (Fe_2O_3), properties 1312-43-2, Indium oxide (In_2O_3) 1345-25-1, Iron oxide (FeO), properties 7631-86-9, Silica, properties 12069-32-8, Boron carbide (B_4C) 12177-86-5, Calcium manganese oxide ($CaMnO_3$) 12676-29-8, Boron silicate 13463-67-7, Titanium oxide (TiO_2), properties 18282-10-5, Tin oxide (SnO_2) 113443-18-8, Silicon oxide (SiO)
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(film; for diffusion barrier interleaves in thermoelec. semiconductor alternate **multilayers**)
IT 1304-82-1, Bismuth telluride **7440-21-3**, Silicon, properties
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(film; for semiconductor conductive layers in thermoelec. alternate **multilayers**)
IT 1314-91-6, Lead telluride (PbTe) **11148-21-3** **12022-99-0**, Iron silicide ($FeSi_2$) **39300-22-6**
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(film; for thermoelec. semiconductor conductor-barrier alternate **multilayers**)

L29 ANSWER 25 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1995:986405 HCAPLUS
DOCUMENT NUMBER: 124:19737
TITLE: Forming a thin film for a **multilayer** semiconductor device
INVENTOR(S): Agnello, Paul David; Cabral, Cyril, Jr.; Clevenger, Lawrence Alfred; Copel, Matthew Warren; D. Heurle, Francois Max; D'Heurle, Francois Max
PATENT ASSIGNEE(S): International Business Machines Corp., USA
SOURCE: Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 677868	A1	19951018	EP 1995-103863	19950316
R: DE, FR, GB				
US 5624869	A	19970429	US 1994-226923	

				19940413
KR 156064	B1	19981201	KR 1995-8351	
				19950411
JP 08045875	A2	19960216	JP 1995-87195	
				19950412
JP 3393731	B2	20030407		
US 5608266	A	19970304	US 1995-458977	
				19950602
PRIORITY APPLN. INFO.:			US 1994-226923 A	
				19940413

AB A method for stabilizing Co silicide/single-crystal Si, amorphous Si, polycryst. Si, germanide/cryst. Ge, polycryst. Ge structures or other semiconductor material structures is described, so that high-temp. processing steps (>750°) do not degrade the structural quality of the Co silicide/Si structure. The steps of the method include forming a silicide or germanide by either reacting Co with the substrate material and/or codepositing the silicide or germanide on a substrate, adding a selective element, either Pt or N, to the Co, and forming the silicide germanide by a std. annealing treatment. Alternatively, the Co alloy can be formed after the formation of the silicide or germanide, resp. As a result, the upper limit of the annealing temp. at which the silicide or germanide will structurally degrade is increased.

IT **7440-21-3**, Silicon, processes **12017-12-8**, Cobalt silicide (CoSi2) **12727-59-2**, Germanium 0-100, silicon 0-100 (atomic)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming thin films for **multilayer** semiconductor devices contg.)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 12727-59-2 HCAPLUS
CN Germanium alloy, base, Ge 0-100,Si 0-100 (9CI) (CA INDEX NAME)

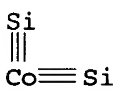
Component	Component Percent	Component Registry Number
Ge	0 - 100	7440-56-4
Si	0 - 100	7440-21-3

IC ICM H01L021-285
CC 76-3 (Electric Phenomena)
ST film formation **multilayer** semiconductor device
IT Silicides
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming thin films for **multilayer** semiconductor devices contg.)
IT Annealing
(in forming thin films for **multilayer** semiconductor devices)
IT Semiconductor devices
(**multilayer**, forming thin films for)
IT **7440-21-3**, Silicon, processes 7440-56-4, Germanium, processes 7440-56-4D, Germanium, compds. 7727-37-9, Nitrogen, processes **12017-12-8**, Cobalt silicide ($CoSi_2$) **12727-59-2**, Germanium 0-100, silicon 0-100 (atomic) 171499-21-1
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(forming thin films for **multilayer** semiconductor devices contg.)

L29 ANSWER 26 OF 34 HCAPLUS

ACCESSION NUMBER: 1995:329869 HCAPLUS
DOCUMENT NUMBER: 122:203869
TITLE: Solid state reaction of Co and Ti with epitaxially-grown $Si_{1-x}Ge_x$ film on **Si** (100) **substrate**
AUTHOR(S): Qi, Wen-Jie; Li, Bing-Zong; Huang, Wei-Ning; Gu, Zhi-Guang; Lu, Hong-Qiang; Zhang, Xiang-Jiu; Zhang, Ming; Dong, Guo-Sheng; Miller, David C.; et al.
CORPORATE SOURCE: Department of Electronic Engineering, Fundan Univ., Shanghai, 200433, Peop. Rep. China
SOURCE: Journal of Applied Physics (1995), 77(3), 1086-92
CODEN: JAPIAU; ISSN: 0021-8979
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The solid state reaction of Co and Ti with an epitaxially grown $Si_{1-x}Ge_x$ strained layer was studied. The reaction was performed in a rapid thermal annealing system. The resulting films were characterized by Rutherford backscattering, Auger electron spectroscopy, XPS, x-ray diffractometry, and SEM. The elec. resistivity and Hall effect were measured at 77-300 K. Rapid thermal annealing of $Co/Si_{0.8}Ge_{0.2}$ at 650° results in a $Co(Si_{0.9}Ge_{0.1})$ film with cubic cryst. structure. At higher temp. $CoSi_2$ is formed with Ge segregation towards the surface. After a multi-step annealing, a highly oriented $CoSi_2$ layer can be grown. For TiN/Ti/Si-Ge, the ternary phase of $Ti(Si_{1-y}Ge_y)_2$ is formed, with a smooth surface and with resistivity comparable to the lowest value exhibited by $TiSi_2$. The Co/Ti/Si-Ge/Si reaction was studied for the 1st time, demonstrating that the uniformity of Co/Si-Ge reaction is improved by applying the Co/Ti bilayer. A $TiN(O)/CoSi_2(Ge)/Si$ **multilayer** structure is formed, and the $CoSi_2(Ge)$ layer exhibits a strongly textured structure. Low temp. measurement reveals that the $CoSi_2(Ge)$ layer has a resistivity slightly higher

than that of CoSi2.
IT 12017-12-8, Cobalt silicide (CoSi2)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **37380-03-3**, Germanium 20, silicon 80 (atomic)
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
RN 37380-03-3 HCAPLUS
CN Silicon alloy, base, Si 61,Ge 39 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	61	7440-21-3
Ge	39	7440-56-4

CC 78-9 (Inorganic Chemicals and Reactions)
ST reaction cobalt titanium **germanium silicon film**
IT Annealing
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
IT 25583-20-4, Titanium mononitride
RL: NUU (Other use, unclassified); USES (Uses)
(capping layer; solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
IT 125135-18-4, Titanium germanide silicide (TiGe0-2Si0-2)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
IT **12017-12-8**, Cobalt silicide (CoSi2) 161582-66-7, Cobalt germanium silicide (CoGe0.1Si0.9)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)
IT 7440-32-6, Titanium, reactions 7440-48-4, Cobalt, reactions **37380-03-3**, Germanium 20, silicon 80 (atomic)
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid-state reaction of Co and Ti with epitaxial Si1-xGex film on **Si**(100) **substrate**)

L29 ANSWER 27 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:668945 HCAPLUS
DOCUMENT NUMBER: 121:268945
TITLE: Selective epitaxial silicon and selective titanium silicide in an industrial integrated cluster tool

AUTHOR(S): Regolini, J. L.; Margail, J.; Morin, C.; Gouy-Pailler, P.
CORPORATE SOURCE: France Telecom, CNET/CNS, Meylan, Fr.
SOURCE: Materials Research Society Symposium Proceedings (1994), 342(Rapid Thermal and Integrated Processing III), 249-54
CODEN: MRSPDH; ISSN: 0272-9172
DOCUMENT TYPE: Journal
LANGUAGE: English

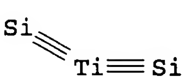
AB Using an industrial integrated cluster reactor the authors have obtained selective epitaxial Si and selective TiSi2 deposition. This is a 200 mm reactor in which epitaxial Si was obtained with <1% (1σ) thickness uniformity and <2% over a 25 wafer batch. Full selectivity of Si on oxide was obtained below a 20 torr working pressure using the DCS/H2 gas system. No loading effect was detected. The main characteristics of this system are described with the most relevant results like:. Sharp interfaces obtained in Si0.7Ge0.3/Si **multilayer** structures grown at 650°, abruptly doped epitaxial layers and residual defect d. TiSi2 was selectively obtained with min. substrate consumption using the (H2SiH4 or DCS)/TiCl4 chem. The elevated source and drain also was successfully tested by selective Si epitaxy followed by in situ selective TiSi2 deposition to compensate for substrate consumption.

IT **7440-21-3P**, Silicon, processes **12039-83-7P**, Titanium silicide (TiSi2) **12623-04-0P**, Germanium 30, silicon 70 (atomic)
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(selective epitaxy of Si, Ge-Si and TiSi2 in industrial integrated cluster CVD reactor)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12623-04-0 HCAPLUS
CN Germanium alloy, base, Ge 53,Si 47 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ge	53	7440-56-4
Si	47	7440-21-3

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75

IT **7440-21-3P**, Silicon, processes **12039-83-7P**, Titanium silicide (TiSi2) **12623-04-0P**, Germanium 30, silicon 70 (atomic)

RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(selective epitaxy of Si, Ge-Si and TiSi2 in industrial integrated cluster CVD reactor)

L29 ANSWER 28 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:91538 HCAPLUS
DOCUMENT NUMBER: 118:91538
TITLE: Production of a **multilayer** system and systems thus produced
INVENTOR(S): Mantl, Siegfried; Bay, Helge
PATENT ASSIGNEE(S): Forschungszentrum Juelich GmbH, Germany
SOURCE: Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
EP 510555	A1	19921028	EP 1992-106724		19920418
EP 510555	B1	19950726			
R: BE, FR, GB, IT, NL					
DE 4113143	A1	19921029	DE 1991-4113143		19910423
DE 4113143	C2	19940804			
US 5250147	A	19931005	US 1992-866012		19920408
JP 06177032	A2	19940624	JP 1992-101428		19920421
CA 2066847	AA	19921024	CA 1992-2066847		19920422
PRIORITY APPLN. INFO.:			DE 1991-4113143	A	19910423

AB **Multilayer** structures are formed by the epitaxial growth of at least a 1st layer followed by the formation of a transition region by simultaneously depositing the material making up the 1st layer and at least a component of the 2nd layer and then subjecting the resulting structure to conditions under which a diffusive sepn. of phases occurs within the transition region to produce the **multilayer** structure.

IT **7440-21-3**, Silicon, uses **12017-12-8**, Cobalt disilicide
RL: USES (Uses)
(deposition and diffusion of, in **multilayer** structure formation)

RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 12017-12-8 HCAPLUS
CN Cobalt silicide (CoSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

IT **37380-03-3**
RL: PROC (Process)
(**multilayer** structures contg., manuf. of)
RN 37380-03-3 HCAPLUS
CN Silicon alloy, base, Si 61,Ge 39 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	61	7440-21-3
Ge	39	7440-56-4

IC ICM C30B033-02
ICS H01L021-20
CC 75-1 (Crystallography and Liquid Crystals)
ST **multilayer** structure epitaxy diffusive sepn
IT Diffusion
Epitaxy
(in **multilayer** structure formation)
IT 1303-00-0, Gallium arsenide, uses **7440-21-3**, Silicon, uses 7631-86-9, Silica, uses **12017-12-8**, Cobalt disilicide
RL: USES (Uses)
(deposition and diffusion of, in **multilayer** structure formation)
IT **37380-03-3**
RL: PROC (Process)
(**multilayer** structures contg., manuf. of)

L29 ANSWER 29 OF 34 HCAPLUS
ACCESSION NUMBER: 1992:581447 HCAPLUS
DOCUMENT NUMBER: 117:181447
TITLE: IR longpass silicon filters
INVENTOR(S): Fujii, Akito
PATENT ASSIGNEE(S): Sumitomo Electric Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04136901	A2	19920511	JP 1990-259963	19900928

PRIORITY APPLN. INFO.: JP 1990-259963 19900928

AB The filter comprises (1) a **Si substrate**, (2) a 1st metal fluoride, (3) a Ge or a Si-Ge alloy, and (4)-(5) a 2nd and a 3rd **metal** fluoride **layer**, wherein (2)-(5) form an antireflective/moisture-barrier laminate; (5) employes MgF2 or CaF2; the fluoride layers consist of cryst. micro-grains; and the linear transmittance is >90% in 3-5μm. The filter has a long-term stability in harsh environments.

IT **7440-21-3**, Silicon, uses
RL: USES (Uses)
(antireflective film-coated IR longpass filters from, as substrate)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT **11148-21-3**
RL: USES (Uses)
(antireflective **multilayer** coating from, for IR longpass silicon filters)
RN 11148-21-3 HCAPLUS
CN Germanium alloy, nonbase, Ge,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ge	7440-56-4
Si	7440-21-3

IC ICM G02B001-10
CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT **7440-21-3**, Silicon, uses
RL: USES (Uses)
(antireflective film-coated IR longpass filters from, as substrate)
IT 7440-56-4, Germanium, uses 7783-40-6, Magnesium fluoride (MgF2) 7789-75-5, Calcium fluoride (CaF2), uses **11148-21-3** 13709-38-1, Lanthanum fluoride (LaF3) 13709-49-4, Yttrium fluoride (YF3)
RL: USES (Uses)
(antireflective **multilayer** coating from, for IR longpass silicon filters)

L29 ANSWER 30 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:437763 HCAPLUS
DOCUMENT NUMBER: 117:37763
TITLE: Application of ion-beam-bevel sectioning to semiconducting and **metallic layer** structures
AUTHOR(S): Barkshire, I. R.; Roberts, R. H.; Greenwood, J. C.; Kenny, P. G.; Prutton, M.
CORPORATE SOURCE: Dep. Phys., Univ. York, Heslington/York, YO1 5DD, UK

SOURCE: Institute of Physics Conference Series (1991), 119(Electron Microsc. Anal. 1991), 17-20
CODEN: IPCSEP; ISSN: 0951-3248
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Si/Si-Ge and Co/Co2Si/CoSi/Si **multilayer** samples were bevel sectioned with 2 keV Ar+ and Xe+ ions. Subsequent imaging and line scanning in the York MULSAM instrument reveal that bevel angles as low as 1 mrad can be cut resulting in .apprx. 10 nm depth resoln. using a 200 nm diam. electron beam. Contributions of ion mixing to depth resoln. can be identified. Study of unexpected spectral features is possible after the bevel was cut.

IT **7440-21-3**, Silicon, uses **11148-26-8**, Germanium 14, silicon 86 (atomic) **12017-11-7**, Cobalt monosilicide **12134-03-1**, Cobalt silicide (Co2Si)
RL: USES (Uses)
(ion beam sectioning of layers of)

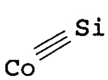
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 11148-26-8 HCAPLUS
CN Silicon alloy, base, Si 70,Ge 30 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	70	7440-21-3
Ge	30	7440-56-4

RN 12017-11-7 HCAPLUS
CN Cobalt silicide (CoSi) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12134-03-1 HCAPLUS
CN Cobalt silicide (Co2Si) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	2	7440-48-4
Si	1	7440-21-3

CC 76-3 (Electric Phenomena)
IT Cutting
(ion-beam, of semiconductor structures and **metal layers**)
IT Microscopy, electron
(scanning, ion beam double sectioning of semiconductor structures and **metal layers** for studies by)
IT **7440-21-3**, Silicon, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses 7440-57-5, Gold, uses **11148-26-8**, Germanium 14, silicon 86 (atomic) **12017-11-7**, Cobalt

monosilicide **12134-03-1**, Cobalt silicide (Co2Si)
RL: USES (Uses)
(ion beam sectioning of layers of)

L29 ANSWER 31 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1990:110607 HCAPLUS
DOCUMENT NUMBER: 112:110607
TITLE: Magnetic **multilayer** films and manufacture thereof
INVENTOR(S): Wakabayashi, Chizuko; Ishiwata, Nobuyuki; Matsumoto, Takayuki
PATENT ASSIGNEE(S): NEC Home Electronics, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01119005	A2	19890511	JP 1987-276782	19871031
PRIORITY APPLN. INFO.:			JP 1987-276782	19871031

AB The film is made from a magnetic Fe-**base film** contg. **Si**, **Ge**, Y, or C (e.g., 1.5-3.5, 5-10, 2-4, and <10 at.%, resp.) and a Permalloy film (e.g., 0.01-0.5 μm and 1-10 nm thick, resp.). The **multilayer** film is formed on a nonmagnetic substrate and heat-treated (e.g., at 500-800° in vacuum for 1 h). The **multilayer** has a high satn. magnetic flux d. and a low coercive force. The film is useful for magnetic head of high d. recording.

IT **11102-68-4 12715-55-8**
RL: PRP (Properties)
(magnetic **multilayer** films from, with Permalloy films)

RN 11102-68-4 HCAPLUS
CN Iron alloy, base, Fe,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Fe	7439-89-6
Si	7440-21-3

RN 12715-55-8 HCAPLUS
CN Iron alloy, base, Fe 98,Si 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Fe	98	7439-89-6
Si	1.8	7440-21-3

IC ICM H01F010-14
ICS G11B005-31

CC 77-8 (Magnetic Phenomena)
ST iron base alloy Permalloy **multilayer** film
IT Recording materials
(magnetic, iron-base alloy-Permalloy **multilayer** films, for heads)
IT **11102-68-4** **12715-55-8** 12716-37-9 39437-45-1
51612-56-7
RL: PRP (Properties)
(magnetic **multilayer** films from, with Permalloy films)
IT 11068-82-9, Permalloy
RL: PRP (Properties)
(magnetic **multilayer** films from, with iron-base alloy films)

L29 ANSWER 32 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1987:506433 HCAPLUS
DOCUMENT NUMBER:	107:106433
TITLE:	Optical recording medium
INVENTOR(S):	Okawa, Hideki
PATENT ASSIGNEE(S):	Toshiba Corp., Japan
SOURCE:	Jpn. Kokai Tokkyo Koho, 3 pp. CODEN: JKXXAF
DOCUMENT TYPE:	Patent
LANGUAGE:	Japanese
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62028940	A2	19870206	JP 1985-168005	19850730
PRIORITY APPLN. INFO.:			JP 1985-168005	19850730

AB The title optical recording medium, in which recording is effected by the optical property change induced by localized mixing or alloying of ≥2 recording layers, has a barrier interlayer formed by an anodic oxidn. of one of the recording layers. An optical disk was prepd. by forming (1) an undercoat layer by CH_4 plasma polymn., (2) a **metal** recording **layer** (e.g., Al, Au, Pb, Sn, Te, Ni), (3) a barrier layer formed by anodic oxidn. of the **metal layer**, (4) a semiconductor recording **layer** (e.g., **Ge**, **Si**), and (5) an acetylcellulose overcoat layer. The barrier layer prevented the dispersion between the recording layers at room temp. so that the recording disk showed excellent storage stability before as well as after recording.
IT **7440-21-3**, Silicon, uses and miscellaneous
RL: TEM (Technical or engineered material use); USES (Uses)
(optical recording material contg.)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM G11B007-24
ICS B41M005-26
CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST optical recording medium **multilayer**; laser recording disk; anodic oxidn product barrier layer
IT 7429-90-5, Aluminum, uses and miscellaneous 7439-92-1, Lead, uses and miscellaneous 7440-02-0, Nickel, uses and miscellaneous **7440-21-3**, Silicon, uses and miscellaneous 7440-31-5, Tin, uses and miscellaneous 7440-56-4, Germanium, uses and miscellaneous 7440-57-5, Gold, uses and miscellaneous 13494-80-9, Tellurium, uses and miscellaneous
RL: TEM (Technical or engineered material use); USES (Uses)
(optical recording material contg.)

L29 ANSWER 33 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1987:506430 HCAPLUS
DOCUMENT NUMBER: 107:106430
TITLE: Optical recording medium
INVENTOR(S): Okawa, Hideki
PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62028943	A2	19870206	JP 1985-168015	19850730
PRIORITY APPLN. INFO.:			JP 1985-168015	19850730

AB The title optical recording medium, in which recording is effected by optical property change induced by localized mixing or alloying of ≥2 recording layers, has a barrier interlayer formed by plasma anodic oxidn. of one of the recording layers. An optical recording disk composed of (1) an undercoat **layer**, (2) a **metal** recording **layer** (e.g., Al, Au, Pb, Sn, Te), (3) a barrier layer formed by plasma anodic oxidn. of the **metal layer** surface, (4) a semiconductor recording **layer** (e.g., **Ge**, **Si**), and (5) an acetylcellulose overcoat layer was prepd. The barrier layer prevented the diffusion between the recording layers at room temp. so that the recording disk showed excellent storage stability before as well as after recording.
IT **7440-21-3**, Silicon, uses and miscellaneous
RL: USES (Uses)
(optical recording layer contg.)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM G11B007-24
ICS B41M005-26
CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST optical recording medium **multilayer**; laser recording disk; plasma anodic oxidn barrier layer
IT 7429-90-5, Aluminum, uses and miscellaneous 7439-92-1, Lead, uses and miscellaneous **7440-21-3**, Silicon, uses and miscellaneous 7440-31-5, Tin, uses and miscellaneous 7440-56-4, Germanium, uses and miscellaneous 7440-57-5, Gold, uses and miscellaneous 13494-80-9, Tellurium, uses and miscellaneous
RL: USES (Uses)
(optical recording layer contg.)

L29 ANSWER 34 OF 34 HCAPLUS
ACCESSION NUMBER: 1987:415661 HCAPLUS
DOCUMENT NUMBER: 107:15661
TITLE: Optical recording medium
INVENTOR(S): Okawa, Hideki
PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62028939	A2	19870206	JP 1985-168004	19850730
PRIORITY APPLN. INFO.:			JP 1985-168004	19850730

AB The title optical recording medium, in which recording is effected by the optical property change induced by localized mixing or alloying of ≥2 recording layers, has a barrier interlayer formed by thermal oxidn. of one of the recording layer. An optical disk was composed of (1) an undercoat layer formed by CH_4-plasma polymn., (2) the **metal** recording **layer** (e.g., Al, Au, Pb, Sn, Te), (3) the barrier layer from the thermal oxidn. product formed by irradiating the surface of the **metal** recording **layer** with IR beam, (4) the semiconductor recording **layer** (e.g., **Ge**, **Si**), and (5) the acetylcellulose overcoat layer. The barrier layer prevented the dispersion between recording layers at room temp. so that the recording disk showed excellent storage stability before as well as after recording.
IT **7440-21-3**, Silicon, uses and miscellaneous
RL: TEM (Technical or engineered material use); USES (Uses)
(optical recording medium contg.)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

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IC    ICM  G11B007-24
      ICS  B41M005-26
CC    74-12 (Radiation Chemistry, Photochemistry, and Photographic and
      Other Reprographic Processes)
ST    optical recording medium multilayer; laser recording disk
IT    7429-90-5, Aluminum, uses and miscellaneous   7439-92-1, Lead, uses
      and miscellaneous 7440-21-3, Silicon, uses and
      miscellaneous   7440-31-5, Tin, uses and miscellaneous   7440-56-4,
      Germanium, uses and miscellaneous   7440-57-5, Gold, uses and
      miscellaneous   13494-80-9, Tellurium, uses and miscellaneous
      RL: TEM (Technical or engineered material use); USES (Uses)
         (optical recording medium contg.)
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